## **APPENDICES**

(Electronic Submittals)

## Appendix A

## **Surface Vapor Flux Data Sheets**

(Electronic)

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SURFACE FLUX MEASUREMENT DATA FORM

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SURFACE FLUX MEASUREMENT DATA FORM 7/17/00 SAMPLERS DATE LOCATION SURFACE DESCRIPTION CURRENT ACTIVITY I.D. NO. INSTRUMENT TYPE TYPE ID NO. INSTRUMENT BASELINE PROJECT QC: BACKGROUND MEASUREMENTS D BLANK MEASUREMENTS D REPLICATE MEASUREMENTS \( \subsection AMBIENT CONCENTRATIONS CHAMBER I.D. PHOTO TAKEN: Yes \ \ \ \ No \ \ \ \ \ CHAMBER SEAL CONDENSATION: Yes 
No 
BARM PRESS P.Sun Cloudy Wind at 5', 37 mph Wind at Seal, mph AMBIENT CONDITIONS: Sun 📉 TEMP RAIN: Yes I No Comment PRIOR CHAMBER CLEANING: Full Wash 
Wet Wipe 
Ory Wipe 
None BACK FLUSHED PRIOR TO START Used PRIOR TO SAMPLING New Used CC CA 1773 SUPPLIER SM SWEEP AIR \_\_ PSIG START <u>1360</u> PSIG STOP Real-Time Temperature (°F) (ppmv) Chamber Ambient Sweep Air Residence Sample Time (L/min) Number Surf Air Surf Air Number Comments 432 ٥ 1 2 14W 3 (19) 142 MV 580 126 136 BIVEDISA 5 COMMENTS: SITE DIAGRAM CES/STOCKDISK

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SURFACE FLUX MEASUREMENT DATA FORM HIHA DATE SURFACE DESCRIPTION CURRENT ACTIVITY MA INSTRUMENT TYPE W I.D. NO. TYPE ID NO. INSTRUMENT BASELINE PROJECT QC: BACKGROUND MEASUREMENTS \(\sigma\) BLANK MEASUREMENTS \(\sigma\) REPLICATE MEASUREMENTS AMBIENT CONCENTRATIONS CHAMBER I.D. \_\_ Yes No 🗆 PHOTO TAKEN: CHAMBER SEAL CONDENSATION: Yes 
No 
BARM PRESS AMBIENT CONDITIONS: Sun 🗋 P.Sun 🗆 Cloudy 🗆 Wind at 5', \_\_\_\_ mph Wind at Seal, \_\_\_\_ mph RAIN: Yes 🗆 No 🗓 TEMP Comment PRIOR CHAMBER CLEANING: Full Wash  $\square$  Wet Wipe  $\bigvee$  Dry Wipe  $\square$  None  $\square$ SAMPLE LINE: BACK FLUSHED PRIOR TO START D PURGED PRIOR TO SAMPLING New D Used cc 6012 supplier SM psig start 60 psig stop Real-Time Temperature (°F) (ppmv) Chamber Ambient Sweep Air Residence Sample Time (L/min) Number Surf Air Surf Air Number Comments 1431 0 1 3 1605 134 ANTOZSU 126 MVSBI 141 COMMENTS: SITE DIAGRAM CES/STOCKDISK

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SURFACE FLUX MEASUREMENT DATA FORM

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SURFACE FLUX MEASUREMENT DATA FORM DATE BOEING SAPI LOCATION TETTON SURFACE DESCRIPTION CURRENT ACTIVITY INSTRUMENT TYPE \_ I.D. NO. \_ TYPE INSTRUMENT BASELINE FROJECT QC: BACKGROUND MEASUREMENTS 🐧 BLANK MEASUREMENTS AMBIENT CONCENTRATIONS REPLICATE MEASUREMENTS CHAMBER I.D. PHOTO TAKEN: Yes No [ CHAMBER SEAL CONDENSATION: Yes 🗆 No 🖒 BARM PRESS AMBIENT CONDITIONS: Sun 19 P. Sun [] Cloudy [] Wind at 5', \_\_\_ mph Wind at Seal, \_\_\_ mph RAIN: Yes I No PRIOR CHAMBER CLEANING: Full Wash | Wet Wipe | Dry Wipe | None | SMEKS KOVEN SAMPLE LINE: BACK FLUSHED PRIOR TO START D PURGED PRIOR TO SAMPLING NEW DUSED SWEEP AIR UWP cc 2890 supplier M psig start 1300 psig stop Real-Time Temperature (°F) (ppmv) Sweep Chamber Ambient Air Residence Time (L/min) M Sample Number Surf Air Surf Air Number Comments 1240 50 ٥ 1346 1 MN#401 1352 2 1300 3 1404 4 1410 5 1XVE03EOI MU 599 1030 103 COMMENTS: SITE DIAGNAM - VAN THUN aour-7 My

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DAY 3 CONTROL

DATE _	7/	SURFACE	FLU			REMI	ENT	DAT.	A FOR	M	CON
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AMBIENT	COMDITION	78: Sun 7	** A (	,	TAPETON	: Хфя	П Ио	Y B	ARM PRESS	***************************************	***************************************
		rain:		440 1.46	Carn	****					
PRIOR CH	CAMBER CLE	ANING: Full	Wash (			rreert⊁£ \	***************************************				
SAMPLE I	INE: ma	ANING: Full		-ı Merc	Arbe 🗌	Dry	Wipe [	Noue	. 🗀		···
		cc <b>_Z899</b>	SUPP	LIER	SM	PSIG :	START (	300_	PSIG STO	9	····
		de manual de annique de la companya		lempera	ture (°F	`)		-Tim <del>a</del> Mw)	and the second		
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Time	Air (L/min)	Residence Number	Surf		1	"]	NA		Sample		
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ند.	- VPUUI	E TRUMA	c ~ l	1950	L		~ <del>~~</del>				WOOD AT THE WOOD AS A

DAY 3

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CHAMBE	RID.	<u> </u>			TAKEN:	_					
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		S: SUN X	?.sun Ľ es.□	Clor No V	Com	Wind at	c 5', [	<u>-3</u> m		c Seal,_	
	TIME: BE	ANING: Full CK FLUSHED PR	Tom will	\						ieh\_	 Used []
						PSIG S	TART _	1700	PSIG STOP		<del></del>
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TO-8 Base Imp

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SURFACE FLUX MEASUREMENT DATA FORM 7/20/66 SAMPLERS DATE ROPING CCATION DRU SOIL SURFACE DESCRIPTION CURRENT ACTIVITY **/W**-I.D. NO. TYPE ID NO. INSTRUMENT TYPE INSTRUMENT BASELINE PROJECT QC: BACKGROUND MEASUREMENTS
AMBIENT CONCENTRATIONS BLANK MEASUREMENTS REPLICATE MEASUREMENTS PHOTO TAKEN: Yes \ No | CHAMBER I.D. CONDENSATION: Yes No S BARM PRESS CHAMBER SEAL Sun P.Sun Cloudy Wind at 5', 2 mph Wind at Seal, mph AMBIENT CONDITIONS: RAIN: Yes \[ \] No \[ \] Comment PRIOR CHAMBER CLEANING: Full Wash Wet Wipe Dry Wipe None BACK FLUSHED PRIOR TO START PURGED PRIOR TO SAMPLING New Dused SWEEP AIR OHP CC SUPPLIER MPSIG START PSIG STOP Real-Time Temperature (°F) (ppmv) Sample Sweep Air Residence Comments Time Number (L/min) Number Chamber **Ambient** Surf Surf Air 50 Λ 150 MU# 525 1 2 102 3 1208 1214 4 728 LXVF01 602 114 124 103 11/16/4 5 120 SITE DIAGRAM Media Checklist Times Media Stop Sample ID Start Method Base MIMEN ·TO-15 T15 25.3 Can/Trap G--CUSE TO RD-52A\*\*\*\*\* NH3 Acid Imp TO-17 Sorbent T17-- SAME LIZUPLON TO-11 DNPH Extended Mhanol DI Imp Ý. VFA Imp DI Imp S-Sultur Bag TO-13 Sorbent T13-

SURFACE	FLUX MEAS	SUREMENT	DATA FORM
7/20/06	SAMPLERS	125	

DATE _	7/20		SAMP	LERS,	(X	<u> </u>				
OCATION	· <u>B</u>	DENO SEP	1 1	<u>6X/R</u>	1)-521	<u>t                                     </u>				
SURFACE	DESCRIPTIO		1 SOIL	r"						
	ACTIVITY	<u>w</u>								
INSTRUM	ENT TYPE	W I.E	. NO		TYPE				ID NO.	and the state of t
	ENT BASELIN						- 1			
PROJECT AMBIENT	QC: BACKGI CONCENTRAT	ROUND MEASURI	EMENTS L	BL BL	ANK MEA	SUREME	NTS 🗅	REPL	ICATE MEAS	urements [
CHAMBER	I.D	*	the best of the second				<b>,</b> ,			
CHAMBER	~~ <del>~~~~~</del>							•	M PRESS _	
AMBIENT	er I	: Sun D P	. Sun 🔲	Cloudy	Mir Mir	nd at 5	S',	mph	Wind at S	eal, mph
TEMP	<u>104</u> RA	IN: Yes 🗌	No D	Comm	ent		<u></u>			
PRIOR C	HAMBER CLEA	NING: Full	Wash 🔲	Wet Wi	pe 📐	Dry Wij	ре	None [	]	<b>4</b>
SAMPLE I	LINE: BAC	K FLUSHED PR	IOR TO S	TART	PURG	ED PRI	OR TO	SAMPLI	ng Dew	Used 🗌
SWEEP A	IR UPIT	cc	SUPPL	ier 之	Asig s	TART _	PSIG S	TOP		
<u> </u>			T							
	Cooper Air	Davidonas		Tempera	ture (°F)			-Time mv)	Sample	The second secon
Time	Sweep Air (L/min)	Residence Number	Chan	nber	Amb	ient			Number	Comments
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	Checklist Media Sa	mple in	Time Start	Stop			5	SHED	IAGRAM	•
Base	neura ou	Inpic its	CO CO CO	7	_		·····			*
TO-15	Can T15			/	]					
	an/Trap G- cid Imp A-		$\leftarrow$		1					
	Sorbent T17-				1					
TO-11	DNPH T11-		$-\chi_{\perp}$		]					Section (Act of the
Extended .hanoi	Diimp <b>M</b> -		$/\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	····	<b>-</b>					OPPONENTIAL AND ADDRESS OF THE PARTY OF THE
	DI Imp V-			<u> </u>						derreininde
Sulfur	Bag S-	<del></del>			1					esenaku viniskin
	Sorbent T13- se Imp T8-									The state of the s

TO-8 Base Imp

T8-

SURFACE FLUX MEASUREMENT DATA FORM 20/06 OCATION SURFACE DESCRIPTION CURRENT ACTIVITY NA ID NO. TYPE INSTRUMENT TYPE I.D. NO. INSTRUMENT BASELINE PROJECT QC: BACKGROUND MEASUREMENTS BLANK MEASUREMENTS REPLICATE MEASUREMENTS AMBIENT CONCENTRATIONS PHOTO TAKEN: Yes \[ \] No \[ \] \_\_\_ CHAMBER I.D. CONDENSATION: Yes No BARM PRESS CHAMBER SEAL AMBIENT CONDITIONS: Sun P.Sun Cloudy Wind at 5', 0-1 mph Wind at Seal, mph RAIN: Yes 🗌 No 🛴 Comment PRIOR CHAMBER CLEANING: Full Wash Wet Wipe Dry Wipe None BACK FLUSHED PRIOR TO START PURGED PRIOR TO SAMPLING New Used SWEEP AIR UHP CC \_\_\_\_SUPPLIER M PSIG START PSIG STOP \_\_\_\_\_ Real-Time Temperature (°F) (ppmv) Sample Residence Sweep Air Comments Time Number Chamber Ambient (L/min) Number Surf Air Surf Air 1049 5,0 1 1055 1101 2 3 4 ido 147 /32 mv 613 SITE DIAGRAM Media Checklist Times Method Media Sample ID Start Stop Base TQ-15 Can T15-SAME LOCATION 25.3 Can/Trap G NH3 Acid Imp A-TO-17 Sorbent T17-TO-11 DNPH T11-Extended .hanol Di imp M. V-VFA Imo Di Imp S-Sulfur Bag TO-13 T13 Sorbent

SURFACE FLUX MEASUREMENT DATA FORM DATE OCATION SURFACE DESCRIPTION CURRENT ACTIVITY ID NO. I.D. NO. TYPE INSTRUMENT TYPE INSTRUMENT BASELINE REPLICATE MEASUREMENTS PROJECT QC: BACKGROUND MEASUREMENTS AMBIENT CONCENTRATIONS BLANK MEASUREMENTS CHAMBER I.D. PHOTO TAKEN: Yes \( \subseteq \) No CONDENSATION: Yes 🗌 No 🔽 BARM PRESS CHAMBER SEAL Sun P.Sun Cloudy Wind at 5', O-) mph Wind at Seal, mph AMBIENT CONDITIONS: Comment RAIN: Yes No 🔽 PRIOR CHAMBER CLEANING: Full Wash [ Wet Wipe Dry Wipe None New D Used BACK FLUSHED PRIOR TO START PURGED PRIOR TO SAMPLING SAMPLE LINE: CC SUPPLIER PSIG START PSIG STOP SWEEP AIR Real-Time Temperature (°F) (ppmv) Sample Residence Sweep Air Comments Time Number (L/min) Number Chamber Ambient NA Surf Air Surf Air 1090 0 1056 1 2 1102 3 1108 1114 4 18 5 1120 SITE DIAGRAM **Media Checklist** Times Method Media Sample ID Start Stop Base TO-15 Can T15-SAME LOZATZON) 25.3 Can/Trap G-NH3 Acid Imp A-Sorbent TO-17 T17-TO-11 DNPH T11-Fxtended thanol Dí imp M. VFA Imp ٧. DI Imp S-Sulfur Bag TO-13 Sorbent T13-WOI TO-8 Base Imp T8Tom Card

SURFACE FLUX MEASUREMENT DATA FORM

DATE	1/2016	&	SAMP		do	5_					
OCATION	, 'V 1	DON GA	T.	M	-111	OTH	JAD.	41			AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
	DESCRIPTION	N My Se	RL				$\iota$				
CHRRENT	ACTIVITY	W-77									
		W I.D	. NO.		TYPE				ID NO.		-
	ENT BASELIN										
PROJECT		ROUND MEASURE	MENTS [	) BI	ANK MEA	SUREME	NTS D	REPL	ICATE MEAS	UREMENTS	
		4		PHOTO '	TAKEN:	Ye	No [	<u> </u>			_
CHAMBER	SEAL.	У		CONDEN	SATION:	Yes	No 1	S BAR	M PRESS		<del>-</del>
		: Sun P.									
		IN: Yes 🗌					* *************************************	~ ~			
	- <del> </del>	NING: Full V			.1	Drv Wi	ре П	None [	7		
		NING: FULL ( K FLUSHED PR									- d []
SAMPLE :	OLG : BAC	_ cc <u>2691</u>	LOR TO 2	TART CA	A BOYCE	name It		100 100		· •	haragai
SWEEP A	ir <u>UW</u>	_ cc 2011	_ SUPPL	TEK 🧵	Lagre 2	IART C	EDIG D	tor			
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	Curan Air	Residence		Tempera	ature (°F)			mv)	Sample	C	
Time	Sweep Air (L/min)	Number	Char	nber	Amb	ient			Number	Com	ments
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0457	1	1	·							CAN#	362
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iono		4							***************************************		
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Media	Checklist		Time		_		S	SITE D	IAGRAM		٠
	Media Sa	mple ID	Start	Stop				y			
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	an/Trap G:	The state of the s						7 -	ų.		
	kcid Imp A										A Chargo
TO-17 TO-11	Sorbent T17. DNPH T11.			······································							Ey digital
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.hanol	Di Imp M		$\overline{z}$		]						ALA PROPERTY AND
VFA Imp	DI Imp V.			***							- Andrewskie and Andr
Sulfur TO-13	Sag S- Sorbent T13-		- +		- 1						E. C.
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DATE		06	MANAGE STATE OF THE STATE OF TH	_		EZ				
OCATION	i <u>U</u>	TENL SSF					B	<u> </u>		
SURFACE	DESCRIPTIO	N DRY	<u> 491 -</u>	(AM	₹ AEYE	AC 1	OCATU	<u>av</u>		
CURRENT	ACTIVITY		-			·····				
INSTRUME	ENT TYPE	M I.D	. NO		TYPE				ID NO	
INSTRUME	ENT BASELIN	E WE								
PROJECT AMBIENT	QC: BACKGI CONCENTRAT	ROUND MEASURE	MENTS	BL.	ANK MEA	SUREME	NTS 🗸	REPL	ICATE MEAS	JREMENTS 🗎
CHAMBER	I.D		·	PHOTO S	PAKEN:	Yes	No [	]		
CHAMBER									M PRESS	
AMBIENT	CONDITIONS	: Sun 💟 P.	Sun 🗌	Cloudy	Win	nd at 5	s', <u>D-</u>	mph	Wind at S	eal, mph
TEMP	F . #3	IN: Yes 🗌							<u> </u>	
PRIOR C	HAMBER CLEA	NING: Full V	wash	Wet Wi	ре	Dry Wi	pe 🔲 1	None [	]	an annual and a state of the st
SAMPLE I	LINE: BAC	K FLUSHED PR	TOR TO S	TART	PURG	ED PRI	OR TO S	AMPLI	ис Д ием	Used 🗆
SWEEP A	er <u>UNP</u>	k flushed pr cc <u>ZEG9</u>	SUPPL	IER <u>M</u>	PSIG S	TART _	PSIG SI	rop		
					iture (°F)		Real-	Time		
Time	Sweep Air	Residence					(ppi	mv)	Sample	Comments
111116	(L/min)	Number	Chan	nber	Amb	ient	N		Number	
			Surf	Air	Surf	Air	*			
2851	<i>5</i> ,0	0						/	a	240# 141
0857		1			·					ON 414
0903		2	-							
0909		. 3					/			
0915		4								
0921	N	5	1030	99	103	930			CLUFOLS	02 MV609
	U									
	Checklist	male ID	Time Start	Stop.			S	HED	IAGRAM	
Method Base	Media Sa	mple ID	Jiai i	3.04						
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	cid Imp A				-					
TO-11	DNPH T11	<u> </u>			lafter of the sales					Branches
Extended	/				VIII.					AND THE PARTY OF T
hanol. Vealenn	Di imp	<del> </del>		······································						Solitoria de la compansión de la compans
VFA Imp Sulfur	Di Imp V				-					Participant of the Control of the Co
	Sorbent T13									A STORY IN COLUMN TO A STORY I

Tom Card

360-802-5541

## SURFACE FLUX MEASUREMENT DATA FORM

DATE	6 T	201010	SAMPI	LERS _	<u> </u>	<u> </u>				- A 15	<u> </u>
OCATION	1	BORNS_	SSFL					25-2	- CF	NOCATION	
SURFACE	DESCRIPTION	N <u>Hey</u>	SOIL	<u>, 5/</u>	WE L	OLAT	<u>wn</u>		<u> </u>	<u>Carro</u>	
CURRENT	ACTIVITY	NA ,		τ							
INSTRUME	INT TYPE	<u>W</u>	. NO		TYPE	***************************************	······································		ID NO.		
INSTRUME	ENT BASELIN	e <u>NA</u>					1	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>			<del></del>
PROJECT AMBIENT	QC: BACKGE CONCENTRAT	ROUND MEASURE	ments Z	BL	ANK MEA	SUREMEN	ers 🔽	REPL	ICATE MEAS	UREMENTS	
CHAMBER	I.D		•••••	PHOTO 1	CAKEN:	Yes Z	No [	]			
CHAMBER	SEAL	<u> </u>		CONDENS	SATION:	Yes 🗌	No [	BAR	M PRESS		
AMBIENT	CONDITIONS	: Sun P.	Sun 🗌	Cloudy	Win	nd at 5	0-1	mph	Wind at S	eal,	mph
TEMP	98 RA	IN: Yes 🗌	No 🔽	Comme	ent						
PRIOR C	HAMBER CLEA	NING: Full I	Wash [	Wet Wi	pe 💆	Dry Wij	pe 🔲 N	lone [	]		
SAMPLE I	LINE: BAC	K FLUSHED PR	IOR TO S	TART	PURC	ED PRI	OR TO S	AMPLIN	іс 🎾 ием	∟□ Used	. <b>[</b> ]
SWEEP A	ir <u>UNP                                    </u>	_ cc <u>CA177</u>	3 SUPPL	ier <i>5/</i> /	PSIG S	TART _	PSIG ST	OP			
(T-							T T				
				Tempera	ture (°F)		Real-				
Time	Sweep Air (L/min)	Residence Number	Chan	nber	Amb	ient	(PP)	,	Sample Number	Comn	nents
	(		Surf	Air	Surf	Air	M				
0855	5,0	. 0								-29	
0901	Ì	1					<b>\</b>	/		CANFIT	
0907		2									
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0125	W	5	107	105	W	980			CL4 02	50)	MUGID
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TON5	Can T15						l'het	z \	Ry Posi Cerat	(\$72mA)	
•	an/Trap <b>G</b> Notice Imp A			and the second section of the second			93	WOON	וכטז מא	1000	
	Sorbert T17							1-	V. 1 15	751	
TO-11	DNPH 111				NAME AND ADDRESS OF THE PARTY O			W	renote	しソ	
Extended	Dilmo N			<del></del>							
hanol. VFA Imp	DI Imp M				-						
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40-8 B	ase Imp T8	~ <u>l</u>	<b>\</b>		į l						

P. 1 Day 4

		ľ.	FACE			SUR	EME	NT D	ATA	A FORI	VI (	( RESEAT
DATE	7/	20	106	SAMP	LERS _		205	:				- AW
OCATIO	N		BOELNO	SSFL	$\mathcal{C}$	ONTRO	<u>L 50</u>	UTY_	140-0	<u> 25A                                    </u>		
SURFACE	DESCRIP		1 De	4 SOL	- SA1	WE A	<u> 5 1</u>	ALL.				
CURRENT	ACTIVIT	Y.	<u> </u>	<u> </u>				·				
INSTRUM	ENT TYPE	`		.D. NO		TYPE				ID NO.		<del>-</del>
INSTRU	ENT BASE	LIN	e <u>MH</u>									
PROJECT AMBIENT	OC: BA	CKGF	OUND MEASU						····		·····	
CHAMBE	R I.D	<del></del>	<u>K</u>		PHOTO T	PAKEN:	Yes 💆	No [	]			<del></del>
CHAMBER	R SEAL _		<u> </u>	<del>(</del>						M PRESS		<b></b>
AMBIEN:	r CONDITI	enoi	: Sun	P.Sun [	Cloudy	Wir	nd at 5	5', <u> </u>	mph	Wind at S	eal,	mph
TEMP		RAI	N: Yes 🗌	ио 💆	Comme	ent				<u>, , , , , , , , , , , , , , , , , , , </u>		
PRIOR (	CHAMBER C	LEA	NING: Full	l Wash	Wet Wi	.pe 🗌 :	Dry Wij	pe 🗌 1	None [	]		
SAMPLE	LINE:	BAC	K FLUSHED	PRIOR TO	START Z	PURG	ED PRI	OR TO S	AMPLIN	Id 🗆 Nev	Use D	ed []
SWEEP A	AIR <u> </u>	IHP	cc <u>CAOF</u>	<i>1</i> 43 suppi	IER S	PSIG S	fart _	PSIG ST	OP			- T
					Tempera	ture (°F)		Real-				The second secon
Time	Sweep		Residence	i i	b	Amb	iont	(66	,	Sample Number	Com	nments
	(L/min	"	Number		mber			M			vanne variable del	
		_	0	Surf	Air	Surf	Air		_/		->c	4
0802	50		1						/		CANE	\$74
0808	-		2								276-	
CB14	-		3									
0822	$+-\lambda$		4								<u> </u>	
0628	<u> </u>		5	000	93"	940	83*		<u>.,,, </u>	BZVFOIS	202	MNV/mA
0832			3	95°	75	17	0)			26 41 01 -		
			,,,,, <del>, , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>									
					<u> </u>			<u></u>			L	
Media	Checklis	t	_	Tim				S	ITE D	IAGRAM		
Method	Media	Sa	mple ID	Start	Stop							
<b>Base</b> TO-15	<b>Can</b>	T15-				<b>-</b> ]		(	AME			
	Can/Trap	G-						" <del>&gt;</del> .	VA. AC			
NH3	Acid Imp	A.				_						
TO-17 TO-11	Sorbent DNPH	TY. T11:										
Extended						_						
.hanoi	DI Imp	M:				_						
VFA imp Sulfur	DI Imp Bag	∕ γ. s.				_						
TO-13		T13-										
	Base Imp	T8-		•						······		

١.	ATE _	7	424	JU	SAMP		4					
	OCATION	1		2000 SSF (	<u> </u>		7A - H	1				
2	URFACE	DESCR	IPTIO	N Dy Soil	<u>Piu</u>	WHLY	-S	ME 1	UNI.	<u> </u>		
	URRENT		_		1							
				N I.D	. ио		TYPE			,	ID NO.	
	NSTRUM									~ ~ ~ ~ ~ ~	*******	T savanaca
Į	PROJECT MBIENT	QC: :	BACKGF INTRAT	ROUND MEASURE	MENTS	BI	ANK MEA	SUREME	ars 🖂	REFI	ICATE MEAS	SOREMENTS D
C	CHAMBER	I.D.		1		PHOTO '	TAKEN:	Yes 🗖	No	口		-
	CHAMBER			<u>Y</u>							RM PRESS	
7	MBIENT	CONDI	TIONS	: Sun P	Sun 🗌	Cloudy	Wi:	nd at 5	·. L	Z mph	Wind at S	Seal,mph
ŗ	remp _	108	RAI	IN: Yes 🗌	No D	Comm	ent					
				NING: Full								
				K FLUSHED PR								# □ Used □
9	SWEEP A	IR	MY	_ cc <u>91773</u>	_ SUPPL	1er <u>S</u>	NPSIG S	TART _	PSIG 8	TOP _		
ſ			T							<b></b>		
						Tempera	ature (°F)		1	-Time omv)	Cample	
	Time		ep Air   nin)	Residence Number	Char	nber	Amb	ient			Sample Number	Comments
ij					Surf	Air	Surf	Air	M			
-[	1040	5	70	, 0							^	-29"/-
	1046	Ī		1								CAN+/ CI
	1052			2		·						352 / 39
	1058			. 3			PLANTING THE PLANT					
	1104	١		4	LINVILLE							
4	(110)	<del></del>	4	5	1242	116	158	108			SAVFa	502 MV621
	1										(354)	
1										ļ	1	
1	1114											DOI M 622
					magen as				,	SITE D	(ろ NAGRAM	98) 个
	Media	Check Media		mple ID	Time Start	es Stop	<del></del>		`	J1 1 Jan 6-	in Oronin	
L	thod				/		<u> </u>			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Vie Ba	ise		<b>N</b> .						é	AM	to local	TREN
Ле За	i <b>se</b> TO-15	Can an/Tran	%2:7E+						N	-30.0		
Vie Ba	i <b>se</b> TO-15 25.3 C NH3 A	Can an/Trap keid imp	A.				1 1					
Me Ba	TO-15 25.3 C NH3 A	an/Trap kcid imp Sorbent	T17									
Me Ba	TO-15 25.3 C NH3 A TO-17	an/Trap cid imp	T17									
Me Ba	TO-15 25.3 C NH3 A TO-17 TO-11 ttended	an/Trap scid imp Sorbent DNPH DI imp	T17. T11.									
Vie Ba	TO-15 25.3 C NH3 A TO-17 TO-11 tended thanol Align	an/Trap Acid imp Sorbent DNPH DI imp	T17- T11- M- V-									
Me Ba	TO-15 25.3 C NH3 A TO-17 TO-11 tended Lhanol FA Imp Sulfur	an/Trap scid imp Sorbent DNPH DI imp	T17- T11- W- V- S-									
Me Ba	TO-15 25.3 C NH3 A TO-17 TO-11 tended .hanol FA Imp Sulfur TO-13 TO-8 B	an/Trap void imp Sorbent DNPH DI imp Bag Sorbent asse imp	M- V- S- T13- T13-									W'S JA

	1 1	RFACE F	LUX	MEA	SUR	EME	NT I	DAT	A FOR	M Jay 5
DATE _	7/21		SAMP	•	Ct	<u> </u>		<del></del>		(844)
OCATION	N BOX	2146 SSF		ECA		K-0-	1			
SURFACE	DESCRIPTIO	N My 4	<u> </u>	<u>Co lek</u>	400			<del></del>		
CURRENT	ACTIVITY	M					<del> </del>			
INSTRUM	ENT TYPE	UA I.D	. NO		TYPE				ID NO.	
INSTRUM	ENT BASELIN	E NA			<u></u>					
PROJECT AMBIENT	QC: BACKG CONCENTRAT	ROUND MEASURE	<u></u>	<del></del>			······		<u> </u>	-
CHAMBER	I.D									
CHAMBER		Ψ,Υ							M PRESS	
AMBIENT	CONDITIONS	: Sun P.	Sun 🗌	Cloudy	Wi	nd at	5 , <u>L</u>	_ mph	Wind at S	Seal,mph
TEMP	1030 RA	IN: Yes 🗌	мо 💆	Comm	ent				<b></b>	
		NING: Full								way was a family and the same of the same
SAMPLE I	LINE: BAC	K FLUSHED PR	OR TO S	TART	] PURG	ED PRI	OR TO	SAMPLIN	ıG □ nei	Used [
SWEEP A	ir Wh	cc	_ SUPPL	ier <u>S</u>	PSIG S	TART _	PSIG S	rop		
				Тетрега	iture (°F)		1 ' '	Time mv)		
Time	Sweep Air (L/min)	Residence Number	Chan	nber	Amb	ient			Sample Number	Comments
			Surf	Air	Surf	Air	NA			
1043	5.0	. 0	<u> </u>	741				/		-29"
1049		1					<del> </del>			CAN#280
100		2								
100	-	3				<u> </u>	/			
-		4					1			
110+		5	138	119 <sup>3</sup>	172,	1030			DAVF02	502 MV623
117			<u> </u>		177	100	<u></u>		7/10/	
16 17										
Madia	Checklist		Time	95		<u>L</u>	<u>L</u>	ITE D	IAGRAM	1
		mple ID	Start	Stop					_	
Base				<del></del>						
NH3 A TO-17 S TO-11	Oan T15 an/Trap G kcid Imp A Sorbent T1% DNPH T11						6	ME	LELATOR	V
Fxtended .hanol VFA Imp Sulfur TO-13	DI Imp M DI Imp V Bag S Sorbent T13									
	see Imp T8					no material and a second a second and a second a second and a second a second and a second and a second and a second a second a second				

DAys (DAy2)

		RFACE F			SUR	EME	NT DAT	A FORI	M	CDAY
DATE	H2110		SAMP	LERS _	(B)	<u> </u>		·····	·····	
OCATIO	n Bo	2M 551	7	Compo	MW A	185-	24		<u></u>	
SURFACE	DESCRIPTIO	N Dry &	al l	LIML	4-5	ANEL	ecti-			<del>,,</del>
CURRENT	ACTIVITY	NA	ı		<i>,</i>					
	ENT TYPE		. NO		TYPE	<u></u>		ID NO.		
INSTRUM	ENT BASELIN	= <u>M</u>						······································		
PROJECT	QC: BACKGI CONCENTRAT	ROUND MEASURE	MENTS	BL	ANK MEA	SUREMEN	TS REPL	ICATE MEAS	UREMENT	<u> </u>
CHAMBER	₹ I.D						No 🗌			
CHAMBER	R SEAL	<u> </u>	***	CONDENS	SATION:	Yes 🗌	No BAF	M PRESS _	,	wrence.
AMBIEN	CONDITIONS	: Sun P.	Sun 🔲	Cloudy	Wi:	nd at 5	., <u>O-2</u> mph	Wind at S	eal,	_ mph
		IN: Yes 🗌		Comme						
PRIOR C	CHAMBER CLEA	NING: Full V	Wash 🔲	Wet Wi	.pe	Dry Wip	e 🗌 None [	]		****
SAMPLE	LINE: BAC	K FLUSHED PR	IOR TO S	START	} PURC	ED PRIC	OR TO SAMPLI	NG New	NQ Us	ed 🗌
	AIR JHP	CCTATIFF3	' SUPPL	IER SN	∕PSIG S	TART I	SIG STOP		`	
SMEEL A	ALK GIV	28991				<i>- 4</i> 0	<b>20</b>			1
				Tempera	ture (°F)		Real-Time (ppmv)	- Camala		
Time	Sweep Air (L/min)	Residence Number	Char	nber	Amb	ient		Sample Number	Co	mments
			Surf	Air	Surf	Air		-		
0946	5.0	. 0							->	'a 4
V/16	<u> </u>	1							M	#214
0152	-	2								
0410		. 3								
1004		4			,	_				
1010	<u> </u>		127	127	1.112	100		CFVF019	\$00	Mug
1016		5	107	122	128	109		CF VE VI	<i>JU 2</i>	THINGE!
					:					
	<u> </u>		<u> </u>		-					
			<u> </u>							
-X		•	T i ma				SITED	IAGRAM		
Media Method	a Checklist √Media Sa	 imple ID	Tim Start	stop			Q11 II. D			
Base				<i></i>		····				
TO-15	Can T15				_ _		11	NE LOC	* 1211 - s	
	Can/Trap G				4		W	NO LOW	Mycon	,
NH3 TO-17	Acid Imp A Sorbent T17	The same of the sa			-					
TO-11	DNPH T11									
Extended										
.hanol	Di imp M									
VFA Imp	DI Imp V	<u> </u>			-					
Sulfur TO-13	Bag S Sorbent T13		-\							
	Rocalmo TA			<u> </u>						

Ay5

	SUF	RFACE F	LUX	MEA	SUR	EME	NT E	)AT	A FORI	M (Byz
DATE	7/21	100	SAMPI	LERS	a	写_				
OCATIO	1	HOUND S	M	<u>Con</u>	vous	SAI	B	24		
SURFACE	DESCRIPTIO	N Aluxo	7C, SA	ne 1	SAR	<u> </u>				
CURRENT	ACTIVITY	W V								
INSTRUM	ENT TYPE	M 1.0	. NO	<del></del>	TYPE		*****		ID NO.	· · · · · · · · · · · · · · · · · · ·
INSTRUM	ENT BASELIN	E								
AMBIENT	CONCENTRAT	ROUND MEASURE								
CHAMBER	I.D.		<del></del>	PHOTO T	TAKEN:	Yes 🗖	No [	]		
CHAMBER	SEAL \	Í		CONDENS	SATION:	Yes 🗌	No	BAR	M PRESS _	
		: Sun P.				nd at 5	, <u>0</u> (	_ mph	Wind at S	eal, mph
		IN: Yes 🗌 🗎								
PRIOR C	HAMBER CLEA	NING: Full V	Vash 🗌	Wet Wi	ре	Dry Wil	pe 🔲 1	None [	<u> </u>	
SAMPLE :	LINE: BAC	K FLUSHED PRI	OR TO S	TART	] PUR	GED PRI	OR TO S	AMPLII	NG D New	Used [
SWEEP A	IR UH	cc CADIT	Zsuppl:	ier 🖄	PSIG S	TART 4	PSIG SI	OP	····	
<u> </u>							Ī			
				Tempera	ture (°F)		Real-			
Time	Sweep Air	Residence	<u> </u>		A l	ient	\\\\\\\		Sample Number	Comments
	(L/min)	Number	Chan Surf	Air	Surf	Air	M			
60/83	50	. 0	Jun	All	- Juii	- Ait		_/		-29
0)47		1						/		CAN4-822
003		2								
007		3			······································	ļ		· · · · · · · · · · · · · · · · · · ·		
1005		4							PEIFOZG	2 mv 620
101	<del>  </del>	5	128	1199	tai	uď			Croncos	
1017	<u> </u>	<u> </u>	12	11.1	UOV_	100				
								····		
						<u> </u>				
Media	Checklist		Time	s			S	ITE D	IAGRAM	
		imple ID	Start	Støp						
Base					٦ [					
TO-15 25.3 C	Can T15 an/Trap G			·····			(7)	11415	LOCATO	Dune
	cid Imp A				1		Z#	V 8 12-5		
	Sorbent T17	E			-					
TO-11 Extended	DNPH T11				_					
.hanol	DI Imp M	<u> </u>			7					
VFA Imp	Di Imp V Bag S									
Suifur TO-13	Bag S Sorbent T1,3	_ <u>X</u>	$\rightarrow$	$\overline{}$	-					
	ase Imp /T8					-				

Tom-Gard

DAYS (DAYS)

	£ t	RFACE F	LUX	MEA	SUR	EME	NT [	TAC	A FORI	M	Cary
DATE	7/21	Ó	SAMP	LERS _	1P3	<u></u>					Marine Committee
OCATION	/	MR 44		£50	FILE	95-5	4				
SURFACE	DESCRIPTIO	N Aly Go	11-54	ME L	amou	/			·····	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	<del></del>
CURRENT	ACTIVITY	. 63									
	ENT TYPE		. мо		TYPE		***************************************		ID NO.		-
INSTRUME	ENT BASELIN	E									
PROJECT AMBIENT	QC: BACKGI	ROUND MEASURE	ments\	S BI	ANK MEA	SUREMEN	TS S	REPL	ICATE MEAS	UREMENTS	<u> </u>
CHAMBER	I.D	5				7	_				•
CHAMBER		<u>Y</u>							m press _		<b>-</b>
AMBIENT	CONDITIONS	: Sun P.	Sun 🗌	Cloudy	☐ Win	nd at 5	i',	_ mph	Wind at S	eal,	mph
	<b>1</b>	IN: Yes 🗌	•								
PRIOR CI	HAMBER CLEA	NING: Full V	Wash 🗍	Wet Wi	pe D	Dry Wip	ре 🔲 1	None [	<u> </u>		<del></del>
CAMPLE 1	TIME BAC	K FLUSHED PRI	OR TO S	TART	L PURC	ED PRI	OR TO	SAMPLII	New	Use	d []
OPERATOR A	NIP	cc 2899	STYDDT.	TER SA	PSTG S	TARTO	) PSIG S	rop		`	
SWEEP A	rk <u>fairi</u>	_ cc 2014	50214		(1010 0	-					1
							Real-	Time			-
			Temperature (°F)  Real-Time (ppmv)  Sample  Comments								
Time	Sweep Air (L/min)	Residence Number Chamber Ambient Sample Number					Com	ments			
Ę			Surf	Air	Surf	Air	NA				
0856	50	. 0								-29	1
0902		1								CAL	541772
oros		2				<u> </u>					
0914		3									
0920		4				-					p
	<b>₩</b>	5	110	1076	116	100			F3VFO19	07	MU618
0946	V	<u> </u>	1W	IV	110	100					
						<b> </b>					
						<u></u>	<u> </u>				
. 682.484	Charleliet		Tim	ac			S	ITE D	IAGRAM		
	Checklist Media Sa	imple ID	Start	8top							
Base	<u> </u>										
TO-15	750 T15		_/_		and the second		/	^/	1 1 15	7. 2/	
	an/Trap G Acid Imp A	· · · · · · · · · · · · · · · · · · ·			-			ME	LOCAT	WN	
	Sorbent T17	**************************************		~~~ <del>~~~*******************************</del>				• •			
TO-11	DNPH T11	I amount the same of the same			discussion Assessed						
Extended					- Comment of the Comm						
hanol.	DI Imp M DI Imp V										
VFA imp Sulfur	Dilmp V Ben S				- Company						
	Sorbent T13										
way of the	man from "Y" O	, 1	,		1 1						

Tom Card

SURFACE DESCRIPTION  CURRENT ACTIVITY  AT  I.D. NO.  TYPE  ID NO.  INSTRUMENT SASSLINE  PRADECT OC. BACKGROUND MEASUREMENTS  PRADECT OC. BACKGROUND MEASUREMENTS  RABIL VA.  COMMERT SAL  W.  COMMERT CHAMBER CLEANING: Full Mash   Wet Wipe   Nose   N	1		7/21/0	RFACE F	SAMP	LERS	15	>					)A <sub>1</sub> 2
CURRENT ACTIVITY NA I.D. NO. TYPE ID NO.  INSTRUMENT TYPE NA I.D. NO. TYPE ID NO.  INSTRUMENT TYPE NA I.D. NO. TYPE ID NO.  INSTRUMENT TYPE NA I.D. NO. TYPE ID NO.  INSTRUMENT CASELINE NA INSTRUMENTS REPLICATE MEASUREMENTS NA INSTRUMENT CONCENTRATIONS  REPLICATE MEASUREMENTS REPLICATE MEASUREMENTS NAME IN CONCENTRATIONS  CHAMBER I.D. PHOTO TAKEN: Ves No No No Namm PRESS  AMBIENT CONDITIONS: Sun Namm PRESS	;	SURFACE	DESCRIPTIO	N JAYS	OL				v			W	<del></del>
INSTRUMENT GASELINE  PROJECT OC: BACKGROUND MEASUREMENTS  CHAMBER I.D.  PHOTO TAKEN: Yes No BARM PRESS  CHAMBER I.D.  CHAMBER SEAL  CONDENSATION: Yes No BARM PRESS  MMSIENT CONDITIONS: Sun P. Sun Cloudy Nind at 5', mph Wind at Seal, mph  PEIOR CHAMBER CLEANING: Full Wash Wet Wape Dry Wipe None SAMPLE LINE: BACK FLUSHED PRIOR TO START FUNGED PRIOR TO SAMPLING New Used SWEED AIR  CHAMBER LINE: BACK FLUSHED PRIOR TO START FUNGED PRIOR TO SAMPLING New Used SWEED AIR  Time Sweep Air Residence Chamber Ambient Number  Chamber Ambient Number Chamber Ambient Number Chamber Ambient Surf Air July Air				<b>3</b> / 14									
PROJECT QC: BACKGROUND MEASUREMENTS   BLANK MEASUREMENTS   REPLICATE MEASUREMENTS    AMBIENT CONCENTRATIONS   FIND   FROTO TAKEN: Yes   No   BARM PRESS    COMDENSATION: Yes   No   BARM PRESS    AMBIENT CONDITIONS: Sun   P. Sun   Cloudy   Wind at 5', mph Wind at Seal, mph    TEMP BY RAIN: Yes   No   Comment    PRIOR CHAMBER CLEANING: Full Wash   Wet Wipe   Dry Wipe   None    SAMPLE LINE: BACK FLUSHED PRIOR TO STANT   PURGED PRIOR TO SAMPLING   New   Used    SWEEP AIR	:	INSTRUM	ENT TYPE	<u>NA</u> I.D	. NO		TYPE	***************************************			ID NO.		
CHAMBER I.D.	,	INSTRUM	ENT BASELIN	E NA									
CHAMBER SEAL  MOBIENT CONDITIONS: Sun  P.Sun   Cloudy   Wind at 5', mph Wind at Seal, mph  FISHER RIN: Yes   No  Comment  FRIOR CHAMBER CLEANING: Full Wash   Wet Wipe   None    FRIOR CHAMBER CLEANING: Full Wash   Wet Wipe   None    FRIOR CHAMBER CLEANING: Full Wash   Wet Wipe   None    SAMPLE LINE: BACK FLUSHED PRIOR TO START   PURGED FRIOR TO SAMFLING   New   Used    SWEEP AIR	;	PROJECT AMBIENT	QC: BACKG	ROUND MEASURE	MENTS	S BI	LANK MEA	SUREME	NTSQ	REPL	ICATE MEAS	UREMENTS	
CHAMBER SEAL  MASIENT CONDITIONS: SUN   P.SUN   Cloudy   Wind at 5', mph Wind at Seal, mph  TEMP	i	CHAMBER	I.D. F			PHOTO	TAKEN:	Yes	] No [	]			
TEMP		CHAMBER	SEAL V	ピラ									
PRIOR CHAMBER CLEANING: Full Mash   Wet Wipe   Dry Wipe   None    SAMPLE LINE: BACK FLUSHED FRIOR TO START   PURGED FRIOR TO SAMPLING   New   Used    SWEED AIR   UH  CC 2899   SUPPLIERS   PSIG START   PSIG START    Time   Sweep Air   Residence   Chamber   Ambient   Ambient   Ambient    Surf   Air   Surf   Air   Air    OBO   5,0 0 0   Comments    OBO   1 0   Comments    Temperature (°F)   Real-Time (ppm)    Surf   Air   Surf   Air    OBO   1 0   CAN 90    OBO   Start   Stop    Base   TO-15   Can   T15-    CAN 90   PS   ST   NOVFOLOD    NHB   Acid long   A    TO-17   Sortent   T7-    To-11   DNPH   T1-    Fatended   Amade   Dl long   M-    Suff   Bg   S-    Suffent   T13-    Su		AMBIENT	CONDITIONS	: Sun 💢 P.	Sun 🔲	Cloudy	/ 🗌 Wi	nd at	5',	_ mph	Wind at S	eal, mph	7
SAMPLE LINE: BACK FLUSHED PRIOR TO START   FURGED PRIOR TO SAMPLING   New   Used    SWEEP AIR   VH   CC 2699   SUPPLIERS   PSIG START   PSIG STOP    Time   Sweep Air   Residence   Number   Chamber   Ambient   Number   Comments    OBO   5,0	1	TEMP	87 RA	IN: Yes	мо 🛛	Comm	ent		······································			· · · · · · · · · · · · · · · · · · ·	
SAMPLE LINE: BACK FLUSHED PRIOR TO START   FURGED PRIOR TO SAMPLING   New   Used    SWEEP AIR   VH   CC 2699   SUPPLIERSM PSIG START   PSIG STOP    Time   Sweep Air   Residence   Number   Chamber   Ambient   Surf   Air   Mark   Mark    OBO   5,0		PRIOR C	HAMBER CLEA	NING: Full	Wash [	Wet W	ipe 💢	Dry Wi	pe 🔲 🛚	None [	]		
Time   Sweep Air   Residence   Chamber   Ambient   Air   MA   Surf   Air   Surf   Air   MA   Surf   Air   Surf													
Time   Sweep Air   Residence   Number   Chamber   Ambient   Surf   Air   Surf   Air   Ai													
Time Sweep Air (L/min) Residence (Number   Ambient   Surf   Air		OHEME IS.	··· · · · · · · · · · · · · · · · · ·										1
Time   Sweep Air (L/min)   Residence   Chamber   Ambient   Surf   Air						T	-4: (PC)		Real-	Time			
Number   Chamber   Ambient   Number   Chamber   Ambient   Number			Sween Air	Residence	<u></u>	Lembers	T T		(pp	mv)		Comment	s
OBO   S10   0   24		Time		Number	Char	nber	Amt	ient	ا ۱۸۰		Number		
DED   1					Surf	Air	Surf	Air	PA				
DO 13   2   3   000   3   000   3   000   4   000   5   000   5   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75   000   75		0601	5,0	. 0						_/_		29	
Media Checklist		0807		1								CAV # 98	<u>ځ</u>
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Media Checklist   Times   SITE DIAGRAM		0319		3									
Nedia Checklist   Times   SITE DIAGRAM		3.7	/	4									
Method Media Sample ID Start Stop  Base T0-15 Can T15- 25.3 Can/Tho G- NH3 Acid Imp A- T0-17 Sorbent 17- T0-11 DNPH T11-  Fxtended Annol DI Imp W- Sulfur Bas S- T0-13 Sorbent T13-	***************************************			5	G43	90	95°	97			NOVFOL	SOZ MU61:	7
Method   Media   Sample   D   Start   Stop		0021		<u></u>		<b>1</b>				***************************************			
Method   Media   Sample   D   Start   Stop													
Method   Media   Sample   D   Start   Stop												The first of the second of the	
Method   Media   Sample   D   Start   Stop	į	<u> </u>			1		1						
## TO-15   Can   T15- 25.3   Can/Trap   G- NH3   Acid   Imp   A- TO-17   Sorbent   T17- TO-11   DNPH   T11-    Fxtended									S	ITE D	IAGRAM		
TO-15 Can T15- 25.3 Can/Trap G- NH3 Acid Imp A- TO-17 Sorbent T17- TO-11 DNPH T11-  Fxtended  hanol DI Imp M- VFA imp DI imp V- Sulfur Bag S- TO-13 Sorbent T13-			Media Sa	mple ID	Start	Stop	<del></del>			· · · · · · · · · · · · · · · · · · ·			
NH3 Acid Imp A- TO-17 Sorbent T17- TO-11 DNPH T11-  Fxtended  hanol DI Imp M- VFA Imp DI Imp V- Sulfur Bag S- TO-13 Sorbent T13-			Can T15		$/ \sim$	·			, mar.	á	سيدار الهدرا	1A	
NH3 Acid Imp A- TO-17 Sorbent T17- TO-11 DNPH T11-  Fxtended  hanol DI Imp M- VFA Imp DI Imp V- Sulfur Bag S- TO-13 Sorbent T13-			•	£					مند. مند	AME	s with	WY	
TO-11 DNPH T11  Fxtended  .hanol DI imp M-  VFA imp DI imp V-  Sulfur Bag S-  TO-13 Sorbent T13-			, ,	<u> </u>						•			
Annol Di Imp M- VFA Imp Di Imp V- Sulfur Bag S- TO-13 Sorbent T13-			*		İ	***************************************							
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Sulfur Bag S- TO-13 Sorbent T13-			· #				_						
TO-13 Sorleent T13-	Vi	•		<u></u>									
TO-8 Base Imp T8-		TO-13	Sorbent T13										
		TO-8 Ba	ise Imp T8	- <u>L</u>					······································	***************************************	····		

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DATE	7/21/0	<del>)</del>	SAMP	LERS		CES	1		_		<i>!</i>
OCATIO	N E	DANG S	SPL	P.	J-9 A	Real	15-	-2/_			
SURFACE		n New Se		Sma	E 10	CARRON					
	ACTIVITY		J								
		j <b>A</b>	. NO		TYPE				ID NO.		
	ENT BASELIN	At -			•	***************************************					
PROJECT		ROUND MEASURE	MENTS	Я ВІ	ANK ME	ASUREME	Z STM	REPI	LICATE MEAS	UREMEN	rs 🗌
	I.D.	F	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	PHOTO	TAKEN:	Yes	No [			-	
CHAMBER		V		CONDEN	SATION:	Yes [	No [	BAI	RM PRESS		
AMRTENT	CONDITIONS	: Sun P.	Sun 🗍	Cloudy	LADE W	nd at	5 ' .	mph	Wind at S	Seal,	mph
		IN: Yes 🔲 1					- / <del></del>			,	
		NING: Full V	٠ '				~~ []	Mona [			
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		K FLUSHED PRI								•∕∐ Us	sed []
SWEEP A	IR VM	cc ZVAY	_ SUPPL	IER <u>S/</u>	(PSIG S	START	rsig s	rop			
							T T				
				Tempera	ature (°F)		Real-	·Time mv)			
Time	Sweep Air (L/min)	Residence Number	Chan	nher	Ami	bient			Sample Number	Co	mments
El .	\		Surf	Air	Surf	Air	NF				
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Ofes			<u></u>				/				
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040	N/	4	<b>®</b>	<u></u>	2.3.6	m. C					
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TO-15	Can 1(15.				]		1	1 15	LEXATUR		
	an/Trap 🔏				·		4-30	the	peryunv		
	cid Imp A- Sorbent <b>T17</b> -										
TO-11	DNPH T11-	Bernard Marine Stranger			-						
Extended					-						
.hanol	DI Imp M-										
VFA Imp	Di Imp	<b> </b>	+	······································	-						
Sulfur TO-13	Bag S- Sorbent T13-	<u> </u>	$\rightarrow$								
	seelme <b>T2</b> .	<b></b>	<del>\</del>		m-14-						

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OORMITO	7/21 N R	12 M. SSF	SAMP	<i>₽</i> • ~	TA - H	MO	7						
	DESCRIPTIC	ON DU COUL	PRI			ME L		2v-					
	SURFACE DESCRIPTION JULY SOIL PRIMARY SAME LOCATION												
	INSTRUMENT TYPE I.D. NO ID NO												
	ENT BASELIN					······································							
PROJECT AMBIENT	ROJECT QC: BACKGROUND MEASUREMENTS BLANK MEASUREMENTS REPLICATE MEASUREMENTS BLANK MEASUREMENTS REPLICATE MEASUREMENTS												
CHAMBER	HAMBER I.D. H PHOTO TAKEN: Yes No D BARM PRESS												
-	CONDENSATION: Yes No N. BARM PRESS												
AMBIENT	MBIENT CONDITIONS: Sun P.Sun Cloudy Wind at 5', 1-2 mph Wind at Seal, mph												
TEMP _	EMP RAIN: Yes No Comment												
		K FLUSHED PR								* LI Used LI			
SWEEP A	IR VPVI	_ cc <u>01773</u>	SUPPL	IER 🔀	PSIG S	TART _	PSIG 8	TOP					
				Tempera	ature (°F)		Real-Time (ppmv)						
Time	Sweep Air (L/min)	Residence Number	Chamber		Ambient				Sample Number	Comments			
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1040	510	. 0								-29"/-			
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0111	**	5	1242	116	155	108			1 77253	SOZ MVGZ			
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1116									DWFd	DOI NU 622			
1119							(398) 4						
	Checklist		Time				:	SITE D	IAGRAM	•			
Method	Media Sa	ample ID	Start/	Stop									
Base	Can T15				7			رور الرحم	me INTA	Des /			
<b>Base</b> TO-15	Can/Trap 6				_		- (	=AVU	3 LEXA	1967 Y			
TO-15 25.3 (	Acid Imp A Sorbent T17-												
TO-15 25.3 (													
TO-15 25.3 ( NH3 TO-17 TO-11	DNPH T11												
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DATE	7/21	Ob	SAMP	LERS	12	55				(BAy2)
OCATIO	N BOT	7N6 SSF	Z 6	HECA	II.	12-0	7			· · · · · · · · · · · · · · · · · · ·
SURFACE	DESCRIPTIO	N My 4	<u></u>	cour	MED					
	ACTIVITY	*								
		<u>UA 1.0</u>	. NO		TYPE				ID NO.	
INSTRUM	ent baselin	E LAT								
PROJECT AMBIENT	QC: BACKGI CONCENTRAT	ROUND MEASURE			<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>				· · · · · · · · · · · · · · · · · · ·	
CHAMBER		k 1					-			
	SEAL		-						M PRESS	
	-							mph	Wind at S	Seal, mph
TEMP _	1030 RA	IN: Yes 🗌	ио 🔽	Comm	ant		······		<u> </u>	
		NING: Full						None [	]	to the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se
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Time	Sweep Air (L/min)	Residence Number	Char	nber I	Amb	ient	l NA		Number	Comments
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	Checklist	 	/ Time				S	ITE D	IAGRAM	
lethod 认 Base	Media Sa	mple ID	Start	Stop						
TO-15	ଠିଲ୍ମ T15-	.r								
	an/Trap G-	- / / /			_		1	Canto	WATO	V
	acid Imp A- Sorbent Tink				_		5	egrit	- 17	confidence of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon
TO-17 8	DNPH <b>T11</b>			······	1					TOMOREMAN
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.hanol	Dilmp M-			<del></del>	-					
/FA imp Sulfur	Di imp V-	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon								
TO-13	Sorbent T13									-ana-vermony two
TO-8 Ba	ase Imp T8-	-[	1					<del></del>	***************************************	

P. Days

	A 4	RFACE F			SUR	EME	NT DAT	A FOR	M	CAM
DATE	Halla		_ SAME	LERS _	_ <i>(B)</i>	>	······································			
OCATIO	n <i>16</i> 0	DNG 551								<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>
SURFACE	DESCRIPTIO	n Ory S	su l	RING	y -S	Anto	ech-			
CURRENT	ACTIVITY	2.1 I/	l		<i>l</i>					
		W- 1.D	. NO.		TYPE			ID NO.		
INSTRUM	ENT BASELIN	E M								
PROJECT	QC: BACKG	ROUND MEASURE	MENTS	BL	ank mea	SUREMEN	TS REPL	ICATE MEAS	UREMENT	<u> </u>
CHAMBER	I.D			PHOTO 1	CAKEN:	Yes	No 🗌			
CHAMBER	SEAL	J		CONDENS	SATION:	Yes 🗌	No 🔲 BAF	m press		
		: Sun P	Sun 🔲	Cloudy	☐ Wi	nd at 5	, <u>0-2</u> mph	Wind at S	eal,	_ mph
		IN: Yes				····				······································
		NING: Full 1								
SAMPLE	LINE: BAC	K FLUSHED PR	IOR TO	START	} PURC	ED PRIC	OR TO SAMPLI	NG Nev	NQ Us	ed 🗍
SWEEP A	IR JHP	cc <i>O(01A3)</i> 28991	SUPPI	ier 🗹	^psig s	TART 4	PSIG STOP			1
				Tempera	ture (°F)		Real-Time (ppmv)			
Time	Sweep Air (L/min)	Residence Number	Chai	mber	Amb	ient		Sample Number	Col	mments
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1004		4								
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1016		5	(LT	122	100	$\mu \sigma$		Crvecia	22	THARE
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			<u> </u>							
26/2011	Checklist		Tim	ac /			SITE D	IAGRAM		
Viethod \		imple ID	Start	Stop	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		_,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Base			/_							
TO-15	Cân T15 Can/Trap G							ns la	1271 ak a	/
	Can/Trap G Acid Imp A			<del></del>			W.	NO LL	y y cord	
TO-17	Sorbent T17				7		•			
TO-11	DNPH T11	$\times$								
Fxtended ,hanol	DI Imp M		T		7					
,itanut VFA Imp	Dilmp V									
Sulfur	Bag S		1							
TO-13/	Sorbent T13	\$ <del></del>		<u> </u>	_					

(BAYZ)

		REACE F	LUX	NIEA	OUK	EIVIE	:NI	UA I	AFUR	IVI (#14
DATE _	7/21	100	SAMP	LERS .	4	\$,				<u> </u>
OCATIO		BOUND S					13	<u>24</u>	**************************************	
SURFACE	DESCRIPTIO	N Alyso	OL, SA	me 1	SATT	<u>.ov                                     </u>				
CURRENT	ACTIVITY	ut								
INSTRUM	ENT TYPE	W I.D	. NO		TYPE	***************************************	····		ID NO.	
INSTRUM	ENT BASELIN	E	.,				~~~~ <del>~~~~~~~~~~</del>		·	
PROJECT AMBIENT	QC: BACKGI CONCENTRAT	***************************************								
CHAMBER	***************************************	_		PHOTO	TAKEN:	Yes	No [	<b>]</b>		
CHAMBER	SEAL \	<u> </u>		CONDEN	SATION:	Yes [	No	BA	RM PRESS	****
AMBIENT	CONDITIONS	: Sun P.	Sun 🗌	Cloudy	Wi Wi	nd at	5,0-	mph	Wind at S	eal, mph
TEMP _	RA.	IN: Yes 🗌	ио 🔽	Comm	ent				<del></del>	
		NING: Full V								
SAMPLE I	LINE: BAC	K FLUSHED PRI	or to s	TART	PUR	GED PRI	OR TO	SAMPLI	NG New	Used [
SWEEP A	IR UH	cc CHOIT	BSUPPL	ier 🗹	PSIG S	$_{\mathtt{TART}}$	PSIG S	TOP	·····	
ı							T T			
				Tempera	iture (°F)			Time		
Time	Sweep Air	Residence				<del></del>	(hh	mv)	Sample Number	Comments
	(L/min)	Number	Chan	ber	Amb	T	M		Admos	
mc: 187	<u> </u>	. 0	Surf	Air	Surf	Air	MT		,	_24
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1017	V	5	131	117	la	uď				
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Madia (	Checklist		Time	e			S	ITE D	IAGRAM	
		mple ID 5	Start	Støp			_			
Base				7	<del>-</del>					
TO-15 25.3 Ca	Can T15- ın/Trap G-		/-				13	A da ke	WATE	· / ****
	cid Imp A						200	VIVES	Der	
	Sorbent T17-									
TO-11 Extended	DNPH T11-		1	<u></u>	<b>-</b>					
	Di Imp M-									
•	Di Imp V-									
Sulfur TO-13 S	Bag S- Forbent T13-	<del>/</del>	$\rightarrow$		-					
	se Imp /18-			~						

P. DAYS (Any 2)

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CHAMBEF	SEAL		<b>/</b>		CONDEN	SATION:	Yes [	] No	BAI	RM PRESS		
AMBIENT	CONDIT	IONS	: Sun P	.Sun 🔲	Cloudy	WHOE WI	ind at	5',	mph	Wind at S	Seal,	mph
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Sulfur	Bag	S-		7		-						
TO-13 TO-8 B		T13- T8-										

Appendix C

**Boring Logs** 

(Electronic)

₩ MWH		Boring #: BEBS MW#: — Sheet 1 of 2  Project: Vapor Migration Modeley Stre  Job #: Site: (Ontrol South  Logged By: F. Vanden Makeviewed By: Fric Vanden  Drilling Contractor:  Drill Rig Type/Method: Hand Arager  Drillers Name: Blu Cisnevox  Borehole Diam./Drill Bit Type: Total Depth 1/6 Ft  Ref. Elev.
Depth to 1st Water (☑):	Sketch Map Time/Date:	Drill Start Time/Date: 7/2 Brill Finish Time/Date: 247
Depth to Water After Drill		
Depth to other Water Bea		Well Completion Time/Date:  Soil Boring Backfill Time/Date: 1530 kg 7/1≥/c
PID/OVA Sample Interval Recovered (in.) Blow Counts / 6 in.	Casing Type & Size of Annulus Filler Depth (Feet) USCS Soil Type	Estimated % Of Sand Sand
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XX X XX X	9 mouse, 10 sm mc. S	And 85 15

Bori	ng #: 🖟	3785	D/W				Project	: Var	or Myrited Mod	Mer Stead	St	neet	a	of	2
₹ Ş	<u> 9</u>	ered	Biow Counts / 6 in.	Retained for Analysis.	Casing Type & Size	81		8		T	,		nated Sand	6 Of	
PID/OVA	Sample Interval	Recovered (in.)	Blow (	Retain	Casin & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description		Gravel	Coarse	Med	Ene	Sill/Clay
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MWH outerop Boring #: LX PS MW#: Project: Job #: Site: Reviewed By: Fic Vaule 1860 Logged By: J Talvad **Drilling Contractor:** Drill Rig Type/Method: GS1eros Drillers Name: Borehole Diam./Drill Bit Type: Total Depth Ref. Elev. Site Sketch Map Sampler Type: 7/25/06 Drill Finish Time/Date: 1010 7/ Depth to 1st Water (♥): Time/Date: Drill Start Time/Date: Depth to Water After Drilling (▼): Time/Date: Well Completion Time/Date: 1015 7/25/05 Depth to other Water Bearing Zones: Soil Boring Backfill Time/Date: Retained for Analysis Casing Type & Size Estimated % Of Blow Counts / 6 in. JSCS Soil Type Recovered (in.) Sand Annulus Filler Depth (Feet) Soil Description No distinguishable fill 10 40 20 3% 11 -

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PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type &	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Descri	ption	Gravel	Coarse	Medium	Fine	Silt/clay	
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# Appendix D

(Electronic)

**D-1: Data Validation Report, July Sampling Activities** 



12269 East Vassar Drive, Aurora, CO 80014 720.535.5502, Fax 720.535.7555

#### DATA ASSESSMENT FORM

Project Title: Vapor Migration Study

Project Manager: D. Hambrick

Analysis/Method: EPA Method TO-15

QC Level: IV/V<sup>1</sup> SDG: 206375

Matrix: Air

No. of Samples: 3

No. of Reanalyses/Dilutions: 0

Date Reviewed: September 23, 2006

Reviewer: K. Shadowlight

Reference: MECX Data Validation Procedure for Volatile Organics (DVP-2,

Rev. 0), EPA Method TO-15 (1/99), and USEPA Contract Laboratory Program National Functional Guidelines for Organic

Data Review (2/94)

Samples Reviewed: MV651, MV652, MV653

#### **Data Validation Findings**

	Findings	Qualifications
1. Sample Management	According to the case narrative for this SDG, the samples were received intact and in good condition, with acceptable canister pressures. The laboratory also provided canister QC certification records for the batches of canisters utilized. No problems were noted regarding sample handling and transport.  The COC was signed and dated by appropriate field and laboratory personnel, and accounted for the samples and analyses presented in this SDG. According to a memo from MWH personnel dated 08/08/06, the EPA ID for sample MV650 was changed to MV653.	No qualifications were required.
	The air samples were analyzed within 30 days of collection.	

Project: Soil Vapor SDG: 206375 Analysis: VOC

		Findings	Qualifications
3. <u>Calibration</u>	and the %Ds	for the initial calibrations for the continuing vere all within the control	No qualifications were required.
4. Method Blanks 082206-MS3	in association SDG. The la canister QC canister used compounds varieter QC canister QC method bland MS3 had a d limit and the however, the	ne method blank analyzed in with the samples in this boratory also supplied a certification blank for the lin this SDG. No target were detected in the certification blank. The k from QC batch 082206-etect between the reporting MDL for trichloroethene; trichloroethene results lined (see Section 10).	No qualifications were required.
5. <u>LCS/LCSD</u> 082206-MS3	the samples compound tri recovered be limits of 70-1 chloride was in the LCSD recoveries was	SD pair was analyzed with in this SDG. Spiked target ichloroethene was slow the laboratory QC 30% in the LCS and vinyl recovered above QC limits only. All remaining ere within the QC limits, is were within the QC limit of	No qualifications were required.
6. Surrogates		es recoveries were within established control limits of	No qualifications were required.
7. <u>MS/MSD</u> <sub>MV653</sub>	dichloroether marginally be MS and MSE trichloroether QC limits in t remaining re-	t compound cis-1,2- ne was recovered elow QC limits in both the D analyses and ne was recovered below the MSD only. The coveries were within C limits of 70-130% and all £30%.	The cis-1,2-dichloroethene result for sample MV653 was not retained (see Section 10); therefore, no qualifications were required.
8. Field QC FB: None ER: MV647 (SDG 206373) FD: None	between the for 1,1-dichlo tetrachloroet	ent blank had detects MDL and the reporting limit broethene and hene, and detects above limits for all remaining bunds.	As the sample results were not retained, no qualifications were required.

Project: Soil Vapor SDG: 206375 Analysis: VOC

	Findings	Qualifications
10. Other	The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration; however, for validation purposes, the reviewer applied the more stringent Method TO-15 criteria of ±40% of the mean initial calibration internal standard area. All internal standard area recoveries were checked from the raw data.	No qualifications were required
	The samples in this SDG required lower volume analyses, or "dilution" due to either matrix interference or high concentrations of target compounds. MDLs and reporting limits were adjusted appropriately for dilution analysis.  Results were reported by the laboratory in both ppbv and units of µg/m³.	
	Isopropanol leak tests were not performed on the samples in this SDG.	All results for both samples were rejected, "R."
Comments	None.	None.

Level IV/V validation consists of cursory review of the summary forms and minimal review of the raw data as necessary. Based on the Level IV report it was determined by the reviewer that additional items required review. The reported values on the summary forms are presumed to be correct and no verification of the values from the raw instrument output is performed. Criteria not reviewed included instrument performance, analytical sequence, initial calibration, continuing calibration, compound identification, and compound quantification.



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG: ry Number:	206375 02	-	
File:	0637502C.D	And the second second second		Date	Sampled:	07/28/06	Time:	15:03	3	
Descriptio	n: MV651			Date	Received:	07/31/06	6			
Can/Tube#	<b>#</b> : 654	And delicate		Date	Extracted:					
Sam_Type	: SA			Date	Analyzed:	08/22/06	Time:	18:26	6	
QC_Batch	: 082206-MS3			Can Diluti	on Factor:	1.44	4	3	3	
Air Volume	e: 5 ml	T A Department		Not Dete	cted Flag:	Ł	J			
								4	2020	2
		MDL	RL	Amount	MDL	RL	Amount	Flag	Sud	90
CAS#	Compound	ppby	ppbv	ppbv	ug/m3	ug/m3	ug/m3		d'an.	000
75-01-4	Vinyl chloride	0.543	2.880	0.543	1.434	7.601	1.434	U	R	1*11
75-35-4	1,1-Dichloroethene	0.334	2.880	0.334	1.368	11.785	1.368	U	1	
156-60-5	trans-1,2-Dichloroethene	1.563	2.592	40.096	6.399	10.611	164.142			
156-59-2	cis-1,2-Dichloroethene	2.438	2.880	66.465	9.978	11.785	271.979			
79-01-6	Trichloroethene	0.235	2.880	436.656	1.302	15.932	2,415.622			
127-18-4	Tetrachloroethene	0.232	2.880	0.664	1.629	20.189	4.654	J	1	11
	,		Spike Amt	•	Amount		QC	Flag	_	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out		
	Toluene-d8		0.200		0.214	107	70-130		-	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IVI

Report File Name: 20637502.MS3 Printed on 8/23/2006



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborator	SDG: ry Number:	206375 03	
File:	0637503B.D				Sampled:	07/28/06		16:09	)
Descriptio					Received:	07/31/06	•		
Can/Tube	<b>#:</b> 165		WAR AND AND AND AND AND AND AND AND AND AND	Date	Extracted:				
Sam_Type	e: SA			Date	Analyzed:	08/22/06	Time:	19:13	}
QC_Batch	: 082206-MS3			Can Dilution	on Factor:	4.95		3	}
Air Volum	e: 20 ml			Not Dete	cted Flag:	U			
					_			R	RV.
		MDL	RL	Amount	MDL	RL	Amount	Flag	Q <sub>v</sub>
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3		(0.
75-01-4	Vinyl chloride	0.467	2.475	0.467	1.232	6.532	1.232	U	- 7
75-35-4	1,1-Dichloroethene	0.287	2.475	0.287	1.175	10.128	1.175	U	
156-60-5	trans-1,2-Dichloroethene	1.343	2.228	1.343	5.499	9.119	5.499	U	
156-59-2	cis-1,2-Dichloroethene	2.095	2.475	2.095	8.575	10.128	8.575	U	
79-01-6	Trichloroethene	0.202	2.475	154.924	1.119	13.692	857.055		
127-18-4	Tetrachloroethene	0.200	2.475	0.436	1.400	17.350	3.054	J	\
	_		Spike Am	t.	Amount		QC	Flag	-
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	_
	Toluene-d8		0.200		0.212	106	70-130		_

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV/I

Report File Name: 20637503.MS3 Printed on 8/23/2006



EPA Metho	od TO-15 SIM GC/MS						SDG:	20637	5
Analytical Method: TO-15 SIM						Laboratory Number:		0	1
File:	0637501B.D			Date	Sampled:	07/28/06	Time:	9:23	В
Descriptio	n: MV653			Date	Received:	07/31/06	;		
Can/Tube#	<b>‡</b> : 791			Date I	Extracted:				
Sam_Type	: SA			Date	Analyzed:	08/26/06	Time:	18:4	4
QC_Batch	: 082606-MS3			Can Dilution Factor:			1.42		1
Air Volume: 0.5 ml				Not Detected Flag:		U			RON
		MDL	RL	Amount	MDL	RL	Amount	Flag	-Ord
CAS#	Compound	ppby		ppbv	ug/m3	ug/m3	ug/m3	9	_ ~
75-01-4	Vinyl chloride	5.4	28.4	122.0	14.1	75.0	322.1		R
75-35-4	1,1-Dichloroethene	3.3	28.4	39.7	13.5	116.2	162.3		1
156-60-5	trans-1,2-Dichloroethene	15.4	25.6	3,227.5	63.1	104.6	13,212.4		
156-59-2	cis-1,2-Dichloroethene	24.0	28.4	2,231.9	98.4	116.2	9,133.2		
79-01-6	Trichloroethene	2.3	28.4	1,924.7	12.8	157.1	10,647.4		1
127-18-4	Tetrachloroethene	2.3	28.4	2.3	16.1	199.1	16.1	U	1
			Spike Amf	t.	Amount		QC	Flag	-
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.192	96	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level II /



#### DATA ASSESSMENT FORM

Project Title: Vapor Migration Study

Project Manager: D. Hambrick

Analysis/Method: EPA Method TO-15

QC Level: IV/V<sup>1</sup> SDG: 206360

Matrix: Air

No. of Samples: 6

No. of Reanalyses/Dilutions: 0

Date Reviewed: September 24, 2006

Reviewer: L. Calvin

Reference: MECX Data Validation Procedure for Volatile Organics (DVP-2,

Rev. 0), EPA Method TO-15 (1/99), and USEPA Contract Laboratory Program National Functional Guidelines for Organic

Data Review (2/94)

Samples Reviewed: MV624, MV625, MV626, MV627, MV628, MV629

#### **Data Validation Findings**

	Findings	Qualifications
1. <u>Sample</u> <u>Management</u>	According to the case narrative for this SDG, the samples were received intact and in good condition, with acceptable canister pressures. The laboratory also provided canister QC certification records for the batches of canisters utilized. No problems were noted regarding sample handling and transport. The COC was signed and dated by appropriate field and laboratory personnel, and accounted for the samples and analyses presented in this SDG.  The air samples were analyzed within 30 days of collection.	No qualifications were required.
3. <u>Calibration</u>	The initial calibration %RSDs and the continuing calibration %Ds were within the method QC limit of ≤30%.	No qualifications were required.

Project: SDG: Analysis:

Soil Vapor 206360 VOC

	Findings	Qualifications
4. <u>Method Blanks</u> 081506-MS1 081706-MS1	Two method blanks were analyzed with the samples in this SDG. The laboratory also supplied canister QC certification blanks for all canisters use in this SDG. No target compounds were detected in the method blanks of the canister QC certification blanks.	ed r
5. <u>LCS/LCSD</u> 081506-MS1 081706-MS1	LCS/LCSD recoveries were within the laboratory QC limits of 70-130%, and the RPDs were within the QC limit of ≤30%.	
6. <u>Surrogates</u>	The surrogate was recovered within the laboratory QC limits of 70-130% for all samples.	ll
7. MS/MSD MV624	The MS/MSD recoveries were within laboratory QC limits of 70-130% and 1 RPDs were within the QC limit of ≤30	No qualifications were required. the %.
8. Field QC FB: None ER: None FD: None	There were no field QC samples identified for this SDG.	No qualifications were required.
10. Other	The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration; however, for validation purposes, the reviewer applied the more stringent Method TO-15 critering of ±40% of the mean initial calibration internal standard area to evaluate samples. All sample internal standard area recoveries were within the control limits.	lied eria
	All of the samples in this SDG requanalysis or reanalysis by full-smethod due to high concentrations target compounds exceeding calibration range of the SIM method, all of the full-scan analyses verifications." Only the acceptable dilutand reanalyses were reported by laboratory. MDLs and reporting liwere adjusted appropriately for dilutand full-scan analysis.	scan s of the and were or cions the imits

Project: Soil SDG: 2 Analysis:

Soil Vapor 206360 VOC

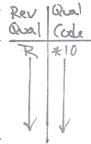
		Findings	Qualifications
10. Other (continued)	the MDL; how discretion of the were changed summaries to limit (for µg/m	reported all nondetects at ever, at the professional ne reviewer, those results on the sample result nondetects at the reporting 3), rather than the MDL.	Detects reported between the
	in both ppbv a reviewer noted reported resul	nd units of µg/m³. The d that the laboratory ts to three decimal places, three significant figures.	MDL and the reporting limit were qualified as estimated, "J."
	on samples M demonstrate	eak tests were performed IV628 and MV629 to efficiency of the sampling opropanol was detected in	Results for sample MV628 were qualified as estimated, "J," for detects and "UJ," for nondetects. Results for the remaining samples were rejected, "R."
Comments	None.		None.

Level IV/V validation consists of cursory review of the summary forms and minimal review of the raw data as necessary. Based on the Level IV report it was determined by the reviewer that additional items required review. The reported values on the summary forms are presumed to be correct and no verification of the values from the raw instrument output is performed. Criteria not reviewed included instrument performance, analytical sequence, initial calibration, continuing calibration, compound identification, and compound quantification.



SDG: 206360 **EPA Method TO-15 Full Scan GC/MS Analytical Method:** TO-15 **Laboratory Number:** 01 07/25/06 Date Sampled: Time: 10:36 File: 0636001B.D **Date Received:** 07/26/06 Description: MV624 Date Extracted: Can/Tube#: 519 08/15/06 Date Analyzed: Time: 17:42 Sam\_Type: SA 1.84 QC\_Batch: 081506-MS1 Can Dilution Factor: Not Detected Flag: U 10 ml Air Volume:

		MDL	RL	Amount	MDL	RL	Amount	Flag
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	
75-01-4	Vinyl chloride	8.6	93.8	8.6	22.8	247.7	22.8	U
75-35-4	1,1-Dichloroethene	14.0	95.7	14.0	57.2	391.5	57.2	U
156-60-5	trans-1,2-Dichloroethene	57.2	81.0	57.2	234.3	331.4	234.3	U
156-59-2	cis-1,2-Dichloroethene	9.8	94.8	9.8	39.9	387.8	39.9	U
79-01-6	Trichloroethene	12.0	94.8	293.6	66.2	524.2	1,624.0	
127-18-4	Tetrachloroethene	7.5	189.5	11.4	52.9	1,328.6	79.8	J
		ni de processo de la constanta de la constanta de la constanta de la constanta de la constanta de la constanta	Spike Amt		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		10.000		9.750	98	70-130	



Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

LEVEL IV/V



EPA Method TO-15 Full Scan GC/MS Analytical Method: TO-15		S Laboratory Num	SDG: 206360 ber: 02
File: 0636002B.D  Description: MV625	Date Sampled: Date Received:	07/25/06 T 07/26/06	ime: 10:57
Can/Tube#: 696	Date Extracted:		
Sam_Type: SA	Date Analyzed:	08/15/06 <b>T</b>	ime: 18:27
QC_Batch: 081506-MS1	Can Dilution Factor:	2.18	1
Air Volume: 10 ml	Not Detected Flag:	U	

0.40#	0	MDL	RL	Amount	MDL	RL	Amount	Flag	Or Ke
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3		de
75-01-4	Vinyl chloride	10.2	111.2	10.2	27.0	293.4	27.0	U	T
75-35-4	1,1-Dichloroethene	16.6	113.4	16.6	67.8	463.9	67.8	U	
156-60-5	trans-1,2-Dichloroethene	67.8	95.9	67.8	277.5	392.7	277.5	U	
156-59-2	cis-1,2-Dichloroethene	11.6	112.3	11.6	47.3	459.4	47.3	U	
79-01-6	Trichloroethene	14.2	112.3	1,292.8	78.4	621.1	7,152.0		
127-18-4	Tetrachloroethene	8.9	224.5	15.7	62.7	1,574.1	110.1	J	<b>N</b>
		Spike Amt. ppbV 10.000		ļ.	Amount		QC	Flag	
	Surrogate Recovery				ppbV	% Rec.	Limits	* = Out	
***************************************	Toluene-d8				10.044	100	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



EPA Metho	od TO-15 Full Scan GC/MS Method: TO-15					Laborator	SDG: y Number:	206366 0	-
File:	0636003A.D			Date	Sampled:	07/25/06	Time:	12:36	ĵ
Descriptio	n: MV626			Date	Received:	07/26/06	;		
Can/Tube#	<b>#</b> : 650			Date	Extracted:				
Sam_Type	: SA		The second secon	Date	Analyzed:	08/15/06	Time:	16:58	3
QC_Batch	: 081506-MS1			Can Dilutio	on Factor:	1.45	;	(	)
Air Volume	e: 0.1 ml		To the second se	Not Dete	cted Flag:	U	1		
***************************************		MDL	RL	Amount	MDL	RL	Amount	Flag	Rev I Qual
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3		Qual Code
75-01-4	Vinyl chloride	682	7,395	682	1,799	19,518	1,799	U	R ×10
75-35-4	1,1-Dichloroethene	1,102	7,540	1,102	4,509	30,854	4,509	U	
156-60-5	trans-1,2-Dichloroethene	4,510	6,380	4,510	18,461	26,118	18,461	U	
156-59-2	cis-1,2-Dichloroethene	769	7,468	1,537	3,145	30,557	6,288	J	
79-01 <b>-</b> 6	Trichloroethene	943	7,468	47,917	5,214	41,311	265,079		
127-18-4	Tetrachloroethene	595	14,935	595	4,168	104,696	4,168	U	V V
			Spike Amt	•	Amount		QC	Flag	- 1
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	_
	Toluene-d8		10.000		9.944	99	70-130		<del></del>

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



EPA Method TO-15 Full Scan GC/MS Analytical Method: TO-15	SDC Laboratory Number	
File: 0636004A.D Description: MV627 Can/Tube#: 2961	Date Sampled: 07/25/06 Time Date Received: 07/26/06 Date Extracted:	: 12:48
Sam_Type: SA QC_Batch: 081506-MS1 Air Volume: 0.05 ml	Date Analyzed: 08/15/06 Time Can Dilution Factor: 1.95 Not Detected Flag: U	: 20:01 0

		MDL	RL	Amount	MDL	RL	Amount	Flag	Rev
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3		Qua
75-01-4	Vinyl chloride	1,833	19,890	1,833	4,838	52,497	4,838	U	R
75-35-4	1,1-Dichloroethene	2,964	20,280	2,964	12,129	82,987	12,129	U	1
156-60-5	trans-1,2-Dichloroethene	12,129	17,160	12,763	49,653	70,249	52,247	J	
156-59-2	cis-1,2-Dichloroethene	2,067	20,085	37,445	8,458	82,189	153,229		and the same of th
79-01-6	Trichloroethene	2,535	20,085	575,722	14,024	111,112	3,184,949		of a disconnection of
127-18-4	Tetrachloroethene	1,599	40,170	1,599	11,209	281,597	11,209	U	V
		Spike Amt. ppbV			Amount		QC	Flag	_
	Surrogate Recovery				ppbV	% Rec.	Limits	* = Out	
	Toluene-d8	10.000			9.765	98	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



EPA Metho	od TO-15 Full Scan GC/MS Method: TO-15					Laboratory	SDG: Number:	206360 05	
File:	0636005A.D			Date	Sampled:	07/25/06	Time:	14:55	
Description	n: MV628			Date I	Received:	07/26/06			
Can/Tube#				Date E	xtracted:				
Sam_Type	: SA			Date /	Analyzed:	08/15/06	Time:	19:16	
QC_Batch:	: 081506-MS1		C	Can Dilutio	n Factor:	1.75		0	
Air Volume	c: 0.05 ml			Not Dete	cted Flag:	U		1	
		MDL	RL	Amount	MDL	RL	Amount	Flag 🗸	avale
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	3	Dio
75-01-4	Vinyl chloride	1,645	17,850	1,645	4,342	47,113	4,342		\$ ×10
75-35-4	1,1-Dichloroethene	2,660	18,200	2,660	10,885	74,476	10,885 7	44740	
156-60-5	trans-1,2-Dichloroethene	10,885	15,400	10,885	44,560	63,044	44,5601	3044U V	V
156-59-2	cis-1,2-Dichloroethene	1,855	18,025	5,491	7,591	73,759	22,470	JJ	all and a second
79-01-6	Trichloroethene	2,275	18,025	126,900	12,586	99,716	702,023	V	
127-18-4	Tetrachloroethene	1,435	36,050	1,435	10,060	252,715	10,060	17/5U UT	す↓
			Spike Amt.	***************************************	Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
Name of the last o	Toluene-d8		10.000		9.594	96	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

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MC 09.24.06 Level II/I

(20)



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SDG: 206360 EPA Method TO-15 Full Scan GC/MS Analytical Method: TO-15 **Laboratory Number:** 06 Date Sampled: 07/25/06 Time: 15:06 File: 0636006A.D Description: MV629 Date Received: 07/26/06 Date Extracted: Can/Tube#: 25 08/17/06 Sam\_Type: SA Date Analyzed: Time: 20:11

QC\_Batch: 081706-MS1 Can Dilution Factor: 1.81
Air Volume: 0.1 ml Not Detected Flag:

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75-01-4	Vinyl chloride	851	9,231	851	2,245	24,364	2,24524	364 U D
75-35-4	1,1-Dichloroethene	1,376	9,412	1,376	5,629	38,514	-5,6293%	
156-60-5	trans-1,2-Dichloroethene	5,629	7,964	5,629	23,044	32,603	-23,044 3	2,63U 🗸
156-59-2	cis-1,2-Dichloroethene	959	9,322	5,166	3,926	38,144	21,141	JJ
79-01-6	Trichloroethene	1,177	9,322	116,732	6,509	51,567	645,771	
127-18-4	Tetrachloroethene	742	9,322	742	5,202	65,345	-5,202 65	1345 U N
			Spike Amt.		Amount		QC	Flag
	Surrogate Recovery		ppbV	***************************************	ppbV	% Rec.	Limits	* = Out
	Toluene-d8		10.000		9.879	99	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

20636006.MS1 Printed on 8/18/2006 Environmental Analytical Service Page 1 of 1

AC 09.24-06

(21)



#### DATA ASSESSMENT FORM

Project Title: Vapor Migration Study

Project Manager: D. Hambrick

Analysis/Method: EPA Method TO-15

QC Level: IV/V<sup>1</sup>
SDG: 206367
Matrix: Air

No. of Reanalyses/Dilutions: 0

Date Reviewed: September 24, 2006

Reviewer: L. Calvin

Reference: MECX Data Validation Procedure for Volatile Organics (DVP-2,

Rev. 0), EPA Method TO-15 (1/99), and USEPA Contract Laboratory Program National Functional Guidelines for Organic

Data Review (2/94)

Samples Reviewed: MV630, MV631, MV632, MV633, MV634, MV635, MV636,

MV637, MV638, MV639, MV640

#### **Data Validation Findings**

	Findings	Qualifications
1. <u>Sample</u> <u>Management</u>	According to the case narrative for this SDG, the samples were received intact and in good condition, with acceptable canister pressures. The laboratory also provided canister QC certification records for the batches of canisters utilized. The COC was signed and dated by appropriate field and laboratory personnel, and accounted for the samples and analyses presented in this SDG. Although the COC indicated all samples were collected in Summa canisters, the sample result summaries for samples MV631, MV632, MV633, and MV634 indicated they were collected in Tedlar bags. The laboratory confirmed that the COC was correct and the sample result summaries were corrected by the reviewer.	No qualifications were required.

Project: Soil Vapor SDG: 206367 Analysis: VOC

	Findings	Qualifications
3. <u>Calibration</u>	The initial calibration %RSDs and the continuing calibration %Ds were within the	No qualifications were required.
	method QC limit of ≤30%.	
4. Method Blanks 081706-MS1 081806-MS3 082206-MS1 082506-MS3	Four method blanks were analyzed with the samples in this SDG. The laboratory also supplied canister QC certification blanks for all canisters used in this SDG.	No qualifications were required.
	Trichloroethene was detected between the MDL and the reporting limit in method blank 081806-MS3; however, the detect for trichloroethene in associated sample MV635 exceeded five times the method blank concentration. No target compounds were detected in the remaining method blanks or the canister QC certification blanks.	
5. <u>LCS/LCSD</u> 081706-MS1 081806-MS3 082206-MS1 082506-MS3	Four LCS/LCSD pairs were analyzed with the samples in this SDG. All recoveries were within the laboratory QC limits of 70-130%, and the RPDs were within the QC limit of ≤30%.	No qualifications were required.
6. <u>Surrogates</u>	The surrogate was recovered within the laboratory QC limits of 70-130% for all samples.	No qualifications were required.
7. <u>MS/MSD</u> <sub>MV638</sub>	MS/MSD analyses were performed on sample MV638 in association with the samples in this SDG. All recoveries were within laboratory QC limits of 70-130% and the RPDs were within the QC limit of ≤30%.	No qualifications were required.
8. Field QC FB: None ER: MV635 FD: MV631/MV633	The equipment blank had detects between the MDL and the reporting limit for 1,1-dichloroethene and tetrachloroethene, and detects above the reporting limits for all remaining target compounds; however, target compound concentrations in all associated site samples exceeded five times the equipment blank concentrations.  The field duplicate samples had common detects above the reporting limits for trans-1,2-dichloroethene, cis-1,2-dichloroethene, and trichloroethene; with RPDs of approximately 150%, 167%, and 110%, respectively. Vinyl chloride was detected below the reporting limit in MV631 and above the reporting limit in MV633.	No qualifications were required.

Project: Soil Vapor SDG: 206367 Analysis: VOC

	Findings	Qualifications
8. Field QC (cont.)	Tetrachloroethene was detected between the MDL and the reporting limit in both samples.	Qualifications
10. Other	The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration; however, for validation purposes, the reviewer applied the more stringent Method TO-15 criteria of ±40% of the mean initial calibration internal standard area to evaluate samples. The internal standard was within the control limits for samples MV636 and MV637, above the control limits for sample MV638, and below the limits for all remainin samples.  Samples MV636, MV637, and MV63 required analysis by full-scan method due to high concentrations of target compound exceeding the calibration range of the SIM method, and all of the full-scan analyse were performed at lower volumes, conditions." All remaining samples analyzed by SIM also required significant dilutions for target compounds. Only the acceptable dilutions and reanalyses were reported by the laboratory. MDLs and reporting limits appropriately for dilution and/or full-scan analysis.	qualified as estimated, "J," and all results were qualified as estimated, "J," for detects and "UJ," for nondetects in site samples MV630, MV631, MV632, MV633, MV634, MV639, and MV640. Equipment blank MV635 was not qualified.
	Results were reported by the laboratory in both ppbv and units of µg/m³. The reviewer noted that the laboratory reported results to three decimal places, rather than to three significant figures.  The laboratory reported all nondetects at the MDL; however, at the professional discretion of the reviewer, those results were changed	
	on the sample result summaries to nondetects at the reporting limit (for $\mu g/m^3$ ), rather than the MDL.	
	Isopropanol leak tests were performed on all of the site samples in this SDG to demonstrate efficiency of the sampling procedure. Isopropanol was detected in samples MV630, MV635, MV636, and MV639.	Results for samples MV630, MV636, and MV639 were qualified as estimated, "J," for detects and "UJ," for nondetects. MV635 was identified as a field QC sample and as such was not qualified for the isopropanol detect.

Project: Soil Vapor SDG: 206367 Analysis: VOC

		Findings	Qualifications
<u>Comments</u>	None.		None.

Level IV/V validation consists of cursory review of the summary forms and minimal review of the raw data as necessary. Based on the Level IV report it was determined by the reviewer that additional items required review. The reported values on the summary forms are presumed to be correct and no verification of the values from the raw instrument output is performed. Criteria not reviewed included instrument performance, analytical sequence, initial calibration, continuing calibration, compound identification, and compound quantification.

Project: SDG: Analysis: Soil Vapor 206367 VOC

	Findings	Qualifications
10. <u>Other</u>	The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration; however, for validation purposes, the reviewer applied the more stringent Method TO-15 criteria of ±40% of the mean initial calibration internal standard area to evaluate samples. The internal standard was within the control limits for samples MV636 and MV637, above the control limits for sample MV638, and below the limits for all remaining samples.	Detects in sample MV638 were qualified as estimated, "J," and all results were qualified as estimated, "J," for detects and "UJ," for nondetects in site samples MV630, MV631, MV632, MV633, MV634, MV639, and MV640. Equipment blank MV635 was not qualified.
	Samples MV636, MV637, and MV638 required analysis by full-scan method due to high concentrations of target compounds exceeding the calibration range of the SIM method, and all of the full-scan analyses were performed at lower volumes, or "dilutions." All remaining samples analyzed by SIM also required significant diluations for target compounds. Only the acceptable dilutions and reanalyses were reported by the laboratory. MDLs and reporting limits were adjusted appropriately for dilution and/or full-scan analysis.	
	Results were reported by the laboratory in both ppbv and units of µg/m³. The reviewer noted that the laboratory reported results to three decimal places, rather than to three significant figures.	Detects reported between the MDL and the reporting limit were qualified as estimated, "J."
	The laboratory reported all nondetects at the MDL; however, at the professional discretion of the reviewer, those results were changed on the sample result summaries to nondetects at the reporting limit (for µg/m³), rather than the MDL.	
	Isopropanol leak tests were performed on all of the site samples in this SDG to demonstrate efficiency of the sampling procedure. Isopropanol was detected in samples MV630, MV635, MV636, and MV639.	Results for samples MV630, MV636, and MV639 were qualified as estimated, "J," for detects and "UJ," for nondetects. As MV635 was identified as a field QC sample, no qualifications were required.
Comments	None.	None.



EPA Meth Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG: ry Number:	206367 01
File: Description Can/Tuber Sam_Type	<b>#</b> : 692			Date Date	Sampled: Received: Extracted:	07/26/06 07/27/06	3	8:07
	: 082506-MS3			Can Diluti	Analyzed: on Factor: cted Flag:	08/25/06 2.33 U	3	14:32 2
CAS# 75-01-4 75-35-4 156-60-5 156-59-2 79-01-6 127-18-4	Compound Vinyl chloride 1,1-Dichloroethene trans-1,2-Dichloroethene cis-1,2-Dichloroethene Trichloroethene Tetrachloroethene	MDL ppbv 8.79 5.41 25.29 39.45 3.81 3.76	RL ppbv 46.60 46.60 41.94 46.60 46.60	Amount ppbv 35.37 5.41 270.52 961.23 3,103.92 3.76	MDL ug/m3 23.20 22.13 103.53 161.45 21.07 26.35	RL ug/m3 122.99 190.69 171.69 190.69 257.80 326.67	Amount ug/m3 93.36 22.13 190 1,107.43 3,933.42 17,171.17 26.35 324	J
	Surrogate Recovery Toluene-d8	:	Spike Am ppbV 0.200		Amount ppbV 0.206	% Rec.	QC Limits 70-130	Flag  * = Out

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20636701.MS3

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EPA Meth Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG: ry Number:	206367 02
File: Description Can/Tuber	0636702A.D on: MV631 #: TBAG 735			Date	Sampled: Received: Extracted:	07/26/06 07/27/06		9:05
Sam_Type QC_Batch Air Volum	: 082506-MS3			Can Dilutio	Analyzed: on Factor: cted Flag:	08/25/06 167.00 ს	)	16:03 0
CAS# 75-01-4 75-35-4 156-60-5 156-59-2	Compound Vinyl chloride 1,1-Dichloroethene trans-1,2-Dichloroethene cis-1,2-Dichloroethene	MDL ppbv 3,150 1,938 9,063 14,139	RL ppbv 16,700 16,700 15,030 16,700	Amount ppbv 11,419 1,938 37,844 67,565	MDL ug/m3 8,315 7,930 37,103 57,858	RL ug/m3 44,077 68,337 61,529 68,337	Amount ug/m3 30,139 7,930/A 154,925 276,480	Flag
79-01-6 127-18-4	Trichloroethene Tetrachloroethene	1,365 1,347	16,700 16,700	1,009,953 2,043	7,552 9,445	92,386 117,069	5,587,156 14,320	J .
40-A-170-A-170-A-170-A-170-A-170-A-170-A-170-A-170-A-170-A-170-A-170-A-170-A-170-A-170-A-170-A-170-A-170-A-170	Surrogate Recovery Toluene-d8		Spike Am ppbV 0.200	t.	Amount ppbV 0.207	% Rec.	QC Limits 70-130	Flag * = Out

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20636702.MS3

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EPA Meth	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborate	SDG: ory Number:	206367 03
Sam_Type QC_Batch	#: TBAG 351 >: SA : 082506-MS3			Date Date Date	Sampled: Received: Extracted: Analyzed: on Factor:	07/26/06 07/27/06 08/25/06 258.00	Time:	10:00 16:41 0
Air Volume	e: 0.1 ml			Not Dete	cted Flag:	Ĺ		ا ا
CAS# 75-01-4 75-35-4 156-60-5 156-59-2 79-01-6 127-18-4	Compound Vinyl chloride 1,1-Dichloroethene trans-1,2-Dichloroethene cis-1,2-Dichloroethene Trichloroethene Tetrachloroethene	MDL ppbv 4,867 2,994 14,002 21,844 2,109 2,081	RL ppbv 25,800 25,800 23,220 25,800 25,800	Amount ppbv 177,194 2,994 273,232 832,200 3,602,952 2,822	MDL ug/m3 12,846 12,251 57,321 89,386 11,666 14,591	RL ug/m3 68,095 105,575 95,057 105,575 142,728 180,861	Amount ug/m3 467,677 42,251105 1,118,545 3,405,413 19,931,872 19,781	Flag val
	Surrogate Recovery Toluene-d8		Spike Am ppbV 0.200	l.	Amount ppbV 0.212	% Rec.	QC Limits 70-130	Flag *= Out

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20636703.MS3

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EPA Meth Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG: ory Number:	206367 04
	#: TBAG 323A			Date	Sampled: Received: Extracted:	07/26/06 07/27/06		10:00
Sam_Type QC_Batch Air Volum	: 082506-MS3			Date Can Dilutio	Analyzed:	08/25/06 207.00 U		17:18 0
CAS#	Compound	MDL ppbv	RL	Amount	MDL	RL	Amount	Flag
75-01-4 75-35-4 156-60-5	Vinyl chloride 1,1-Dichloroethene	3,905 2,402	20,700 20,700	ppbv 112,928 2,402	ug/m3 10,306 9,829	ug/m3 54,635 84,706	ug/m3 298,057 9,829당사	1010 US
56-59-2 '9-01-6	trans-1,2-Dichloroethene cis-1,2-Dichloroethene Trichloroethene	11,234 17,526 1,692	18,630 20,700 20,700	263,494 747,989 3,424,928	45,990 71,717 9,360	76,267 84,706 114,514	1,078,677 3,060,816 18,947,023	+
127-18-4	Tetrachloroethene	1,670	20,700 Spike Am	2,080 t.	11,707 Amount	145,110	14,584 QC	J V
	Surrogate Recovery Toluene-d8		ppbV 0.200		ppbV 0.207	% Rec. 103	Limits 70-130	* = Out

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

3) MDL and RL are adjusted for sample volume and can dilution.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20636704.MS3 Printed on 8/26/2006

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UC 09.24.06 Level II/I

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EPA Meth Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG: ry Number:	206367 05
File:	0636705B.D				Sampled:	07/26/06	Time:	10:31
Description	#: <del>TBAG</del>				Received:	07/27/06		
Sam_Type	C = .				Extracted: Analyzed:	00105100	T	40.44
	: 082506-MS3			Can Dilution	-	08/25/06 150.00	Time:	19:14
Air Volum					cted Flag:	130.00 U		I ^ı
		MDL	RL	Amount	MDL	RL	Amount	Flag
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	r lag
75-01-4	Vinyl chloride	141.5	750.0	402.1	373.4	1,979.5	1,061.2	197
75-35-4	1,1-Dichloroethene	87.0	750.0	87.0	356.1	3.069.0	.356.1 <i>50</i> 2	9.00 W
156-60-5	trans-1,2-Dichloroethene	407.0	675.0	3,160.1	1,666.3	2,763.3	12,936.6	1
156-59-2	cis-1,2-Dichloroethene	635.0	750.0	7,267.2	2,598.4	3,069.0	29,737.6	Ì
79-01-6	Trichloroethene	61.3	750.0	13,409.7	339.1	4,149.1	74,183.5	<b>√</b>
127-18-4	Tetrachloroethene	60.5	750.0	60.5	424.2	5,257.6	424.2524	57.60 With
	_		Spike Am	t.	Amount	***********************	QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.186	93	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20636705,MS3 Printed on 8/26/2006

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5P

EPA Metho Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborator	SDG: y Number:	206367 06
File: Description			•		Sampled: Received:	07/26/06 07/27/06		11:50
Can/Tube# Sam_Type QC_Batch:					Extracted: Analyzed: on Factor:	08/18/06 1.74		20:22 3
Air Volume	e: 250 ml				cted Flag:	U		.)
		MDL	RL	Amount	MDL	RL	Amount	Flag
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	96° 190
75-01-4	Vinyl chloride	0.013	0.070	0.251	0.035	0.184	0.663	
75-35-4	1,1-Dichloroethene	0.008	0.070	0.043	0.033	0.285	0.175	JJ
156-60-5	trans-1,2-Dichloroethene	0.038	0.063	0.038	0.155	0.256	0.1550.2	
156-59-2	cis-1,2-Dichloroethene	0.059	0.070	0.194	0.241	0.285	0.793	
79-01-6	Trichloroethene	0.006	0.070	1.011	0.031	0.385	5.594	
127-18-4	Tetrachloroethene	0.006	0.070	0.032	0.039	0.488	0.222	JJ
			Spike Amt	•	Amount		QC	Flag
-	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.188	94	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20636706.MS3

Printed on 8/22/2006

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EPA Metho	d TO-15 Full Scan GC/MS Method: TO-15					Laboratory	SDG: Number:	206367 07
File:	0636707A.D			Date	Sampled:	07/26/06	Time:	11:29
Description	n: MV636				Received:	07/27/06	illito.	11.29
Can/Tube#	: 160				Extracted:	07727700		
Sam_Type:	: SA				Analyzed:	08/17/06	Time:	18:42
QC_Batch:	081706-MS1			Can Dilutio		2.25		0
Air Volume	: 0.5 ml				cted Flag:	U		
		MDL	RL	Amount	MDL	RL	Amount	Flage
CAS#	Compound	ppby	ppbv	ppbv	ug/m3	ug/m3	ug/m3	anal gr
75-01-4	Vinyl chloride	212	2,295	212	558	6,057	-558 40	57 11 77-1
75-35-4	1,1-Dichloroethene	342	2,340	342	1,399	9,575	1,399 94	- 6.21
156-60-5	trans-1,2-Dichloroethene	1,400	1,980	1,400	5,729	8,106	5,729	
156-59-2	cis-1,2-Dichloroethene	239	2,318	1,850	976	9,483	7,569	J
79-01-6	Trichloroethene	293	2,318	31,494	1,618	12,821	174,226	7
127-18-4	Tetrachloroethene	185	2,318	185	1,293	16,246	1.29310	244U W
			Spike Am	t.	Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		10.000		9.800	98	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

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EPA Method TO-15 Full Scan GC/MS Analytical Method: TO-15		Laboratory I	SDG: Number:	206367 08
File: 0636708A.D  Description: MV637  Can/Tube#: 515	Date Sampled: Date Received: Date Extracted:	07/26/06 07/27/06	Time:	14:03
Sam_Type: SA QC_Batch: 081706-MS1 Air Volume: 0.05 ml	Date Analyzed: Can Dilution Factor: Not Detected Flag:	08/17/06 1.73 U	Time:	19:27 0

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75-01-4	Vinyl chloride	1,626	17,646	1,626	4,292	46,574	4,292 46	21 11 1
75-35-4	1,1-Dichloroethene	2,630	17,992	2,630	10,760	73,624	10,76073	
156-60-5	trans-1,2-Dichloroethene	10,761	15,224	10,761	44.051	62,323	44,051-6	
156-59-2	cis-1,2-Dichloroethene	1,834	17,819	2,059	7,504	72,916	8,428	J
79-01-6	Trichloroethene	2,249	17,819	49,157	12,442	98,576	271.942	
127-18-4	Tetrachloroethene	1,419	17,819	1,419	9,945	124,914	9,945 124	914 U U
	Surrogate Recovery		Spike Amt.		Amount ppbV	% Rec.	QC Limits	Flag * = Out
	Toluene-d8		10.000		9.765	98	70-130	Out

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

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20636708.MS1 Printed on 8/18/2006

Toluene-d8



EPA Method TO-15 Full Scan GC/MS Analytical Method: TO-15	SDG: Laboratory Number:	206367 09
File: 0636709A.D  Description: MV638  Can/Tube#: 775	Date Sampled: 07/26/06 Time: Date Received: 07/27/06 Date Extracted:	14:58
Sam_Type: SA QC_Batch: 082206-MS1 Air Volume: 517 ml	Date Analyzed: 08/22/06 Time: Can Dilution Factor: 1.71 Not Detected Flag: U	21:11 2

	_	MDL	RL	Amount	MDL	RL	Amount	Flag /
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ava
75-01-4	Vinyl chloride	0.16	1.69	0.16	0.41	4.45	0.41 4:4	5 U/VII
75-35-4	1,1-Dichloroethene	0.25	1.72	0.25	1.03	7.04	1.03 7.0	1 - 1
156-60-5	trans-1,2-Dichloroethene	1.03	1.46	1.03	4.21	5.96	4.21 5.9	
156-59-2	cis-1,2-Dichloroethene	0.18	1.70	2.51	0.72	6.97	10.26	-
79-01-6	Trichloroethene	0.21	1.70	55.96	1.19	9.42	309.59	4
127-18-4	Tetrachloroethene	0.14	3.41	0.93	0.95	23.88	6.50	15
			Spike Amt.		Amount	·	QC	Flag
	Surrogate Recovery		ppbV		Vdqq	% Rec.	Limits	* = Out

10.040

100

70-130

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

10.000

Level II/I

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EPA Meth Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborator	SDG: y Number:	<b>206367</b> 10
File: Descriptio Can/Tube				Date	Sampled: Received: Extracted:	07/26/06 07/27/06	Time:	15:22
Sam_Type				Date	Analyzed:	08/25/06	Time:	13:54
	: 082506-MS3			Can Diluti	on Factor:	1.58		2
Air Volum	e: 20 ml			Not Dete	cted Flag:	U		
		MDL	RL	Amount	MDL	RL	Amount	Flag
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	lay July 9
75-01-4	Vinyl chloride	0.15	0.79	0.40	0.39	2.09	1.06	
75-35-4	1,1-Dichloroethene	0.09	0.79	0.09	0.38	3.23	0.38 3.43	3 U Wal -
156-60-5	trans-1,2-Dichloroethene	0.43	0.71	0.43	1.76	2.91	1.762.9	
156-59-2	cis-1,2-Dichloroethene	0.67	0.79	0.67	2.74	3.23	2.74 3.2	
79-01-6	Trichloroethene	0.06	0.79	11.17	0.36	4.37	61.79	20 4
127-18-4	Tetrachloroethene	0.06	0.79	0.18	0.45	5.54	1.29	J
			Spike Am		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.		* = Out
	Toluene-d8		0.200		0.204	102	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20636710.MS3 Printed on 8/26/2006

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EPA Meth Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG: ery Number:	206367 11
File:	0636711A.D			Date	Sampled:	07/26/06	Time:	15:30
Description	on: MV640				Received:	07/27/06		
Can/Tube	#: 817			Date	Extracted:			
Sam_Type	e: SA			Date	Analyzed:	08/25/06	Time:	15:13
QC_Batch	: 082506-MS3			Can Diluti	on Factor:	2.65		2
Air Volum	ne: 0.5 ml			Not Dete	cted Flag:	U		
		MDL	RL	Amount	MDL	RL.	Amount	Flag /
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	riag ya
75-01-4	Vinyl chloride	10.00	53.00	10.00	26.39	139.89	26:39 139	.89U Wat
75-35-4	1,1-Dichloroethene	6.15	53.00	6.15	25.17	216.88	25.17214	
156-60-5	trans-1,2-Dichloroethene	28.76	47.70	180.47	117.75	195.27	738.79	+
156-59-2	cis-1,2-Dichloroethene	44.87	53.00	649.40	183.62	216.88	2,657.38	
79-01-6	Trichloroethene	4.33	53.00	7,531.44	23.97	293.20	41,664.65	
127-18-4	Tetrachloroethene	4.28	53.00	10.25	29.97	371.54	71.87	J 🅢
		,	Spike Am	t.	Amount		QC	Flag
	Surrogate Recovery	1000	ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.206	103	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20636711.MS3 Printed on 8/26/2006

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#### DATA ASSESSMENT FORM

Project Title: Vapor Migration Study

Project Manager: D. Hambrick

Analysis/Method: EPA Method TO-15

QC Level: IV/V<sup>1</sup>
SDG: 206353
Matrix: Air

No. of Samples: 16
No. of Reanalyses/Dilutions: 0

<u>Date Reviewed</u>: September 23, 2006 Reviewer: K. Shadowlight

Reference: MEC<sup>X</sup> Data Validation Procedure for Volatile Organics (DVP-2,

Rev. 0), EPA Method TO-15 (1/99), and USEPA Contract Laboratory Program National Functional Guidelines for Organic

Data Review (2/94)

Samples Reviewed: MV601, MV602, MV603, MV604, MV605, MV606, MV607,

MV601B, MV608, MV609, MV610, MV611, MV612, MV613,

MV614, MV615

#### **Data Validation Findings**

	Findings	Qualifications
1. Sample Management	According to the case narrative for this SDG, the samples were received intact and in good condition, with acceptable canister pressures. The laboratory also provided canister QC certification records for the batches of canisters utilized. No problems were noted regarding sample handling and transport. The COC was signed and dated by appropriate field and laboratory personnel, and accounted for the samples and analyses presented in this SDG.  The air samples were analyzed within 30 days of collection.	No qualifications were required.

Project: Soil Vapor SDG: 206353 Analysis: VOC

	Findings	Qualifications
3. <u>Calibration</u>	The %RSDs for the initial calibrations and the %Ds for the continuing calibrations were all within the control limit of ≤30%.	No qualifications were required.
4. Method Blanks 080606-MS3 080706-MS3 081506-MS3 081706-MS1 081706-MS3	There were five method blanks analyzed in association with the samples in this SDG. The laboratory also supplied canister QC certification blanks for all canisters used in this SDG. No target compounds were detected in the canister QC certification blanks.	No qualifications were required.
	Method blanks from QC batches 080606-MS3, 080706-MS3 had detects between the reporting limit and the MDL for trichloroethene. Method blank 081706-MS3 had target compound detects for trichloroethene and tetrachloroethene between the MDL and the reporting limit. All blanks had one or more associated samples with detects at concentrations less than five times the method blank concentrations.	Results for trichloroethene reported between the MDL and reporting limit in samples MV605, MV606, MV608, MV610, MV612, MV613, MV614, and MV615 were qualified as nondetects, "U," at the reporting limit.
5. <u>LCS/LCSD</u> 080606-MS3 080706-MS3 081506-MS3 081706-MS1 081706-MS3	Five LCS/LCSD pairs were analyzed with the samples in this SDG. Spiked target compound trichloroethene was recovered above the laboratory QC limits of 70-130% in the LCSD only of LCS/LCSD pair 080706-MS3 and tetrachlorethene was recovered above QC limits in the LCS only of LCS/LCSD pair 081506-MS3. All remaining recoveries were within the QC limits, and all RPDs were within the QC limit of \$30%.	No qualifications were required.
6. <u>Surrogates</u>	The surrogate was recovered below control limits in sample MV609. All remaining surrogate recoveries were within the method-established control limits of 70-130%.	The detect for trichlorethene in sample MV609 was qualified as estimated "J."
7. MS/MSD MV601 MV610	The recoveries were within laboratory QC limits of 70-130% and all RPDs were ≤30%.	No qualifications were required.
8. Field QC FB: None ER: MV654 (SDG 206359) FD: None	The equipment blank had a detect between the MDL and the reporting limit for trichloroethene; however, the reportable concentrations of trichloroethene in the associated site samples exceeded five times the concentration reported in the equipment blank. No other target compounds were	No qualifications were required.

Project: SDG: Analysis: Soil Vapor 206353 VOC

	Findings	Qualifications
	reported in the equipment blank.	
10. Other	The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration; however, for validation purposes, the reviewer applied the more stringent Method TO-15 criteria of ±40% of the mean initial calibration internal standard area. All internal standard area recoveries were checked from the raw data. The internal standard area was below control limit but >25% of the applicable initial calibration mean area for sample MV612. The internal standard area for sample MV611 was above the control limit.	
	Sample MV612 required lower volume analysis, or "dilution" due to either matrix interference or high concentrations of target compounds. Sample MV611 required reanalysis by full-scan due to high concentrations of target compounds exceeding the calibration range of the SIM method. Only the acceptable dilutions and reanalyses were reported by the laboratory. MDLs and reporting limits were adjusted appropriately for dilution and/or full-scan analysis.	
	Results were reported by the laboratory in both ppbv and units of µg/m³, and in addition, a flux measurement was provided for each result.	Any detects between the MDL and the reporting limit were qualified as estimated, "J."
	The laboratory reported all nondetects at the MDL; however, at the professional discretion of the reviewer, those results were changed on the sample result summaries to nondetects at the reporting limit (for µg/m³), rather than the MDL.	
Comments	None.	None.

<sup>&</sup>lt;sup>1</sup> Level IV/V validation consists of cursory review of the summary forms and minimal review of the raw data as necessary. Based on the Level IV report it was determined by the reviewer that additional items required review. The reported values on the summary forms are presumed to be correct and no verification of the values from the raw instrument output is performed. Criteria not reviewed included instrument performance, analytical sequence, initial calibration, continuing calibration, compound identification, and compound quantification.



QC

Limits

70-130

Flag

\* = Out

EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG: ory Number:	206353 01	
File: Descriptio	0635301A.D				Sampled:		Time:		
Can/Tube#					xtracted:	01121100			
Sam_Type	e: SA			Date A	nalyzed:	08/15/06	Time:	18:43	
QC_Batch	: 081506-MS3		Ca	n Dilutio	n Factor:	1.40		3	
Air Volum	e: 500 ml			Flu	x Factor:		0.0385	0.0036	
							Rev	Qual	
		MDL	Amount	MDL	RL	Amount	Flux Qual	Ede	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)		
75-01-4	Vinyl chloride	0.005	0.005	0.014	0.074	0,014	74 0.0005 U	. %	U
75-35-4	1,1-Dichloroethene	0.003	0.003	0.013	0.115	<b>0.</b> 0130-เม	5 0.0005		U
156-60-5	trans-1,2-Dichloroethene	0.015	0.015	0.062	0.103	0.062∂-10	5 0.0024		U
156-59-2	cis-1,2-Dichloroethene	0.024	0.024	0.097	0.115	0.0970-11	5 0.0037	.   \	Ų
79-01-6	Trichloroethene	0.002	0.005	0.013	0.155	0.027	0.0010	5	J
127-18-4	Tetrachloroethene	0.002	0.013	0.016	0.196	0.093	0.0036	7	J
								-	

Spike Amt.

ppbV 0.200 Amount

ppbV

0.215

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

Surrogate Recovery

Toluene-d8

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level Lsa/23/06/V/I

% Rec.

108



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM	AND THE REAL PROPERTY OF THE P				Laborato	SDG ory Number		353 02	
File:	0635302A.D			Date	Sampled:	07/19/06	Time	):		
Descriptio Can/Tube#					Received:	07/21/06				
Sam_Type					Extracted: Analyzed:	08/15/06	Time	ı: 19	9:26	
QC_Batch	: 081506-MS3		Ca		n Factor:	2.16			3	
Air Volum	e: 500 ml			Flu	x Factor:		0.038	5 0.0	036	
								Rev a	)val	
		MDL	Amount	MDL	RL	Amount	Flux			Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min	) \ \		
75-01-4	Vinyl chloride	0.008	0.008	0.022	0.114	0.022011	4 0.0008	U	\$	U
75-35-4	1,1-Dichloroethene	0.005	0.005	0.021	0.177	0.0210.1	77 0.0008		Ì	U
156-60-5	trans-1,2-Dichloroethene	0.023	0.023	0.096	0.159	0,09604	59 0.0037			U
156-59-2	cis-1,2-Dichloroethene	0.037	0.037	0.150	0.177	0.1500.	770.0058	1	$\checkmark$	Ų
79-01-6	Trichloroethene	0.004	0.005	0.020	0.239	0.028	0.0011	=		j
127-18-4	Tetrachloroethene	0.003	0.005	0.024	0.303	0.038	0.0015	7		J
<del></del>			Spike Amt		Amount		QC	Fla	g	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = C	ut	
	Toluene-d8		0.200		0.197	99	70-130			

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

20635302.MS3 Printed on 8/17/2006



LevelNI (csa/27/06

Qual

EPA Method TO-15 SIM GC/MS SDG: 206353
Analytical Method: TO-15 SIM Laboratory Number: 03

File: 0635303A.D Date Sampled: 07/19/06 Time:

Description: MV603 Date Received: 07/21/06

Can/Tube#: 652 Date Extracted:

 QC\_Batch:
 081506-MS3
 Can Dilution Factor:
 2.01
 3

 Air Volume:
 500 ml
 Flux Factor:
 0.0385
 0.0036

		MDL	Amount	MDL	RL	Amount	Flux	Qua/	cde	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min	) `		
75-01-4	Vinyl chloride	0.008	0.008	0.020	0.106	0.0200.0	6 0.0008	Ц	\$	Ų
75-35-4	1,1-Dichloroethene	0.005	0.005	0.019	0.165	0.0190.16	·5 0.0007	1		U
156-60-5	trans-1,2-Dichloroethene	0.022	0.022	0.089	0.148	0.0890.14	8 0.0034	1		U
156-59-2	cis-1,2-Dichloroethene	0.034	0.034	0.139	0.165	0.1390.16	√S 0.0054	<b>V</b>	1	U
79-01-6	Trichloroethene	0.003	0.005	0.018	0.222	0.030	0.0012	5	The state of the s	J
127-18-4	Tetrachloroethene	0.003	0.013	0.023	0.282	0.089	0.0034	5		J
									I	

	Spike Amt.	Amount		QC	Flag	
Surrogate Recovery	ppbV	ppbV	% Rec.	Limits	* = Out	
Toluene-d8	0.200	0.215	108	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

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EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG ory Number		6353 04	
File: Descriptio Can/Tube#				Date I	Sampled: Received: Extracted:		Time	:		4
Sam_Type	: SA				•	08/15/06	Time	: 2	0:52	
QC_Batch	: 081506-MS3		Ca	n Dilutic	n Factor:	1.91			3	
Air Volum	e: 500 ml			Flu	x Factor:		0.038	5 0.0	0036	
							R	و ل	Q101	
		MDL	Amount	MDL	RL	Amount	Flux	Qual	wde	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min			-
75-01-4	Vinyl chloride	0.007	0.007	0.019	0.101	0.019	0.0007	JI		J
75-35-4	1,1-Dichloroethene	0.004	0.004	0.018	0.156	0,0180.	≶6 0.0007	u !	\$	U
156-60-5	trans-1,2-Dichloroethene	0.021	0.021	0.085	0.141	0.085∂√	4 ( 0.0033	- Land		U
156-59-2	cis-1,2-Dichloroethene	0.032	0.032	0.132	0.156	0.132 0.1	56 0.0051	1	V	U
79-01-6	Trichloroethene	0.003	0.012	0.017	0.211	0.066	0.0025	J	-	J
127-18-4	Tetrachloroethene	0.003	0.009	0.022	0.268	0.065	0.0025	5		J
	·		Spike Amt	•	Amount		QC	Fla	ıg	-
-	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = (	Out	
	Toluene-d8		0.200		0.221	111	70-130			

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IVI



**EPA Method TO-15 SIM GC/MS** 

Analytical Method:

SDG:

206353

**Laboratory Number:** 

05

File:

0635305A.D

Date Sampled: 07/19/06

Time:

**Description: MV605** 

Date Received: 07/21/06

Can/Tube#: 729

**Date Extracted:** 

Time:

0.0385

15:04

Sam\_Type: SA

Date Analyzed: 08/17/06

QC\_Batch: 081706-MS3

**Can Dilution Factor:** 

1.94

3

Air Volume:

500 ml

Flux Factor:

0.0036

		MDL	Amount	MDL	RL	Amount Flux	Qual	de	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3 ug/(m2*mi	n)		
75-01-4	Vinyl chloride	0.007	0.007	0.019	0.102	0.0190.102.0.0007	L	\$	U
75-35-4	1,1-Dichloroethene	0.005	0.005	0.018	0.159	0.0180.6590.0007			U
156-60-5	trans-1,2-Dichloroethene	0.021	0.021	0.086	0.143	0.0860.1430.0033			U
156-59-2	cis-1,2-Dichloroethene	0.033	0.033	0.134	0.159	0.134 0.159 0.0052	4	4	U
79-01-6	Trichloroethene	0.003	0.019	0.018	0.215	0.105 0.2150.0040	U	B,\$	J
127-18-4	Tetrachloroethene	0.003	0.011	0.022	0.272	0.075 0.0029	T		J

	Spike Amt.	Amount		QC	Flag
Surrogate Recovery	ppbV	ppbV	% Rec.	Limits	* = Out
Toluene-d8	0.200	0.202	101	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Ks 9/23/06 Leve (14)



EPA Method TO-15 SIM GC/MS

Analytical Method:

**TO-15 SIM** 

SDG:

206353

**Laboratory Number:** 

06

File:

0635306A.D

Date Sampled: 07/19/06

Time:

Description: MV606

Can/Tube#: 193

**Date Extracted:** Date Analyzed: 08/17/06

15:43

Sam\_Type: SA

QC\_Batch: 081706-MS3

**Can Dilution Factor:** 1.73

Date Received: 07/21/06

Time:

Air Volume:

500 ml

Flux Factor:

0.0385

0.0036

Rev Dird

		MDL	Amount	MDL	RL	Amount	Flux	Qual	Lock	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*mir	า) ้		•
75-01-4	Vinyl chloride	0.007	0.007	0.017	0.091	0,0170.0	91 0.0007	u	\$	U
75-35-4	1,1-Dichloroethene	0.004	0.004	0.016	0.142	0.0160	142_0.0006	a.		U
156-60-5	trans-1,2-Dichloroethene	0.019	0.019	0.077	0.127	0.0770	27 0.0030			U
156-59-2	cis-1,2-Dichloroethene	0.029	0.029	0.120	0.142	0.1200.	142 0.0046	1	1	U
79-01-6	Trichloroethene	0.003	0.017	0.016	0.191	0.0950.	19 0.0037	u	B. \$	J
127-18-4	Tetrachloroethene	0.003	0.012	0.020	0.243	0.085	0.0033	1		J
			Dmillon A4		A 4					

	Spike Amt.	Amount		QC	Flag	
Surrogate Recovery	ppbV	ppbV	% Rec.	Limits	* = Out	
Toluene-d8	0.200	0.207	103	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



EPA Metho Analytical I	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG ory Number		-
File: Descriptior Can/Tube#				Date F	Sampled: Received: extracted:		Time	:	
Sam_Type:	: SA			Date /	Analyzed:	08/17/06	Time	: 16:25	5
QC_Batch:	081706-MS3		Ca	n Dilutio	n Factor:	1.74		3	3
Air Volume	e: 500 ml			Flu	x Factor:		0.0385	0.0036	3
							R	les Que	: 1
		MDL	Amount	MDL	RL	Amount	Flux	PV61 60	€ Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min	)	
75-01-4	Vinyl chloride	0.007	0.007	0.017	0.092		<b>℃120.0007</b>	u \$	Ų
75-35-4	1,1-Dichloroethene	0.004	0.004	0.017	0.142	0.0170	420.0007	European Committee	U
156-60-5	trans-1,2-Dichloroethene	0.019	0.019	0.077	0.128	0.0770.	1280.0030	200	U
156-59-2	cis-1,2-Dichloroethene	0.029	0.029	0.121	0.142	0.12101	120.0047	1 1	U
79-01-6	Trichloroethene	0.003	0.023	0.016	0.193	0.125	0.0048	7	J
127-18-4	Tetrachloroethene	0.003	0.012	0.020	0.244	0.081	0.0031	丁	J
		(	Spike Amt		Amount	h er hafter maken vælder mer villet hav el serm	QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.214	107	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

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EPA Method TO-15 SIM GC/MS SDG: 206353
Analytical Method: TO-15 SIM Laboratory Number: 08

File: 0635308A.D Date Sampled: 07/19/06 Time:

Description: MV601B Date Received: 07/21/06

Can/Tube#: 517 Date Extracted:

 Sam\_Type:
 SA
 Date Analyzed:
 08/17/06
 Time:
 17:08

 QC\_Batch:
 081706-MS3
 Can Dilution Factor:
 5.29
 3

Air Volume: 500 ml Flux Factor: 5.29 3

		MDL	Amount	MDL	RL	Amount	Flux	2041	isde	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min	)		
75-01-4	Vinyl chloride	0.020	0.020	0.053	0.279	0.0530.2	79 0.0020	U	\$	U
75-35-4	1,1-Dichloroethene	0.012	0.012	0.050	0.433	0.0500.4	1530.0019	1		U
156-60-5	trans-1,2-Dichloroethene	0.057	0.057	0.235	0.390	0,2350.9	90.0090	100		U
156-59-2	cis-1,2-Dichloroethene	0.090	0.090	0.367	0.433	0.3670.	330.0141	V	1	U
79-01-6	Trichloroethene	0.009	0.023	0.048	0.585	0.129	0.0050	J		J
127-18-4	Tetrachloroethene	0.009	0.022	0.060	0.742	0.156	0.0060	J		J

	Spike Amt.	Amount		QC	Flag
Surrogate Recovery	ppbV	ppbV	% Rec.	Limits	* = Out
Toluene-d8	0.200	0.186	93	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

143/23/0b Level 1V/V

Wal



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG: ory Number:		
File: Descriptio Can/Tube#				Date I	Sampled: Received: Extracted:				
Sam_Type: SA QC_Batch: 080606-MS3			Date Analyz Can Dilution Fac		•	08/06/06 1.36		14:52 3	
Air Volum	e: 500 ml			Flu	ıx Factor:		0.0385 Ro	0.0036	
		MDL	Amount	MDL	RL	Amount	Flux ♀	ual code Fl	lag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)		
79-01-6	Trichloroethene	0.002	0.015	0.012	0.150	0.0850	1500.0033	LB,\$	J
			Spike Amt		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.177	89	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

See 14



EPA Method TO-15 SIM GC/MS Analytical Method: TO-15 SIM						Laborat	SDG: ory Number:	206353 10	
File: Description Can/Tube#				Date F	Sampled: Received: xtracted:	07/19/06 07/21/06			
Sam_Type: QC_Batch:		America Address and Americ	Cai		Analyzed: n Factor:	08/06/06 1.40		15:36 3	
Air Volume	e: 500 ml			Flu	x Factor:		0.0385 Rev	0.0036	
		MDL	Amount	MDL	RL	Amount	Flux 🖓	al sae	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)		_
79-01-6	Trichloroethene	0.002	0.027	0.013	0.155	0.149	0.0057	5 5	J
			Spike Amt.	•	Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200	,	0.086	43	70-130	*	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Wq. 28.06 Level IVI

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EPA Method TO-15 SIM GC/MS Analytical Method: TO-15 SIM						Laborat	SDG: tory Number:	206353 11	
File: Description Can/Tube#				Date F	Sampled: Received: extracted:				
Sam_Type: SA QC_Batch: 080606-MS3 Air Volume: 500 ml			Date Analyzed: Can Dilution Factor: Flux Factor:			08/06/06 1.37		16:20 3 0.0036	
CAS#	Compound	MDL ppby		MDL ug/m3	RL ug/m3	Amount ug/m3	Flux 💐 ug/(m2*min)	1ª Code	Flag
79-01-6	Trichloroethene	0.002	0.005	0.012	0.152		ISJ_0.0010	U. B,\$	J
			Spike Amt		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.185	93	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IXI



EPA Method TO-15 Full Scan GC/MS

Analytical Method:

TO-15

SDG:

Time:

Time:

0.0385

206353

Laboratory Number:

12

File:

0635312A.D

Description: MV611

Can/Tube#: 362

Sam\_Type: SA

QC\_Batch: 081706-MS1

Air Volume:

531 ml

Date Sampled: 07/19/06

Date Received: 07/21/06

Date Extracted:

Date Analyzed: 08/17/06

17:58

2

Can Dilution Factor: Flux Factor: 1.42

0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min	Quel Quel Flag
79-01-6	Trichloroethene	0.17	20.95	0.96	7.62	115.89	4.462	JI
			Spike Amt.	. Amoun		Amount		Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		10.000		10.268	103	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)





**EPA Method TO-15 SIM GC/MS** 

**Analytical Method:** 

**TO-15 SIM** 

SDG:

206353

**Laboratory Number:** 

13

File:

0635313A.D

Toluene-d8

Description: MV612

Can/Tube#: 697

Sam\_Type: SA

QC\_Batch: 080706-MS3

Air Volume:

200 ml

Date Sampled: 07/19/06

Flux Factor:

0.180

Can Dilution Factor:

Time:

Date Received: 07/21/06

**Date Extracted:** 

Date Analyzed: 08/07/06

90

Time:

17:21

1.38

0.0385 0.0036

-								RW	. Qual
		MDL	Amount	MDL	RL	Amount	Flux	1000	ware Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*mi	n)	
79-01-6	Trichloroethene	0.006	0.031	0.031	0.382	0.1720	3820.0066	ut	8, \$ IJ
	Surrogate Recovery	Spike Am ppbV		•	Amount ppbV	% Rec.	QC Limits	Fla * = 1	•

0.200

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

les 9.22.06 Leve 114

70-130



EPA Meth						SDG:	206353		
Analytical	Analytical Method: TO-15 SIM					Laborat	ory Number:	14	
File:	0635314A.D			Date	Sampled:	07/19/06	Time:		
Description	on: MV613				Received:				
Can/Tube	#: 784			Date E	xtracted:				
Sam_Type: SA			Date Analyzed:			08/06/06	Time:	18:31	
QC_Batch: 080606-MS3			Can Dilution Factor:					3	
Air Volum	ne: 500 ml		Flux Factor:				0.0385		
							Re	v Quel	
		MDL	Amount	MDL	RL	Amount	Flux 🗽	usi we F	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)		
79-01-6	Trichloroethene	0.002	0.018	0.013	0.155	0.102 0	\≶ 0.0039	U B,\$	J
			Spike Amt		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.180	90	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

16 9.23.06 Level 14T



EPA Metho	od TO-15 SIM GC/MS Method: TO-1					Laborat	SDG: ory Number		
•	File: 0635315A.D  Description: MV614  Can/Tube#: 525  Sam_Type: SA			Date F	•	07/19/06 07/21/06	Time	:	
Sam_Type QC_Batch:			Ca		Analyzed: on Factor:	08/06/06 1.39	Time	19:14	
Air Volum	e: 500 ml			Flu	x Factor:		0.0385 0	0.0036	
	_	MDL		MDL	RL	Amount	Flux	100 1 1 100 Com	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)		
79-01-6	Trichloroethene	0.002	0.004	0.013	0.154	0.022	54 0.0008	U B,\$	J
			Spike Amt	•	Amount		QC	Flag	
	Surrogate Recover	y	ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.194	97	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Us 9.23.06 Level 14

20635315.MS3 Printed on 8/7/2006



**EPA Method TO-15 SIM GC/MS** SDG: 206353 **Analytical Method: TO-15 SIM** Laboratory Number: 16 File: Date Sampled: 07/19/06 Time: 0635316A.D **Description: MV615** Date Received: 07/21/06 Can/Tube#: 172 **Date Extracted:** Sam\_Type: SA Time: 16:39 Date Analyzed: 08/07/06 QC\_Batch: 080706-MS3 Can Dilution Factor: 1.41 3 Air Volume: 500 ml Flux Factor: 0.0385 0.0036 Qual wak Flag MDL Amount MDL RL Amount Flux 0000 CAS# Compound ppbv ppbv ug/m3 ug/m3 ug/m3 ug/(m2\*min) 0.070 0.156 0.0027 79-01-6 Trichloroethene 0.002 0.013 0.013 0.156 B,\$ Spike Amt. **Amount** QC Flag ppbV Surrogate Recovery ppbV % Rec. Limits \* = Out 0.200 0.166 83 70-130 Toluene-d8

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level 14



#### DATA ASSESSMENT FORM

Project Title: Vapor Migration Study

Project Manager: D. Hambrick

Analysis/Method: EPA Method TO-15

QC Level: IV/V<sup>1</sup>
SDG: 206353
Matrix: Air

No. of Samples: 16
No. of Reanalyses/Dilutions: 0

<u>Date Reviewed</u>: September 23, 2006 Reviewer: K. Shadowlight

Reference: MEC<sup>X</sup> Data Validation Procedure for Volatile Organics (DVP-2,

Rev. 0), EPA Method TO-15 (1/99), and USEPA Contract Laboratory Program National Functional Guidelines for Organic

Data Review (2/94)

Samples Reviewed: MV601, MV602, MV603, MV604, MV605, MV606, MV607,

MV601B, MV608, MV609, MV610, MV611, MV612, MV613,

MV614, MV615

#### **Data Validation Findings**

	Findings	Qualifications
1. Sample Management	According to the case narrative for this SDG, the samples were received intact and in good condition, with acceptable canister pressures. The laboratory also provided canister QC certification records for the batches of canisters utilized. No problems were noted regarding sample handling and transport. The COC was signed and dated by appropriate field and laboratory personnel, and accounted for the samples and analyses presented in this SDG.  The air samples were analyzed within 30 days of collection.	No qualifications were required.

Project: Soil Vapor SDG: 206353 Analysis: VOC

	Findings	Qualifications
3. <u>Calibration</u>	The %RSDs for the initial calibrations and the %Ds for the continuing calibrations were all within the control limit of ≤30%.	No qualifications were required.
4. <u>Method Blanks</u> 080606-MS3 080706-MS3 081506-MS3 081706-MS1 081706-MS3	There were five method blanks analyzed in association with the samples in this SDG. The laboratory also supplied canister QC certification blanks for all canisters used in this SDG. No target compounds were detected in the canister QC certification blanks.	No qualifications were required.
	Method blanks from QC batches 080606-MS3, 080706-MS3 had detects between the reporting limit and the MDL for trichloroethene. Method blank 081706-MS3 had target compound detects for trichloroethene and tetrachloroethene between the MDL and the reporting limit. All blanks had one or more associated samples with detects at concentrations less than five times the method blank concentrations.	Results for trichloroethene reported between the MDL and reporting limit in samples MV605, MV606, MV608, MV610, MV612, MV613, MV614, and MV615 were qualified as nondetects, "U," at the reporting limit.
5. <u>LCS/LCSD</u> 080606-MS3 080706-MS3 081506-MS3 081706-MS1 081706-MS3	Five LCS/LCSD pairs were analyzed with the samples in this SDG. Spiked target compound trichloroethene was recovered above the laboratory QC limits of 70-130% in the LCSD only of LCS/LCSD pair 080706-MS3 and tetrachlorethene was recovered above QC limits in the LCS only of LCS/LCSD pair 081506-MS3. All remaining recoveries were within the QC limits, and all RPDs were within the QC limit of ≤30%.	No qualifications were required.
6. <u>Surrogates</u>	The surrogate was recovered below control limits in sample MV609. All remaining surrogate recoveries were within the method-established control limits of 70-130%.	The detect for trichlorethene in sample MV609 was qualified as estimated "J."
7. MS/MSD MV601 MV610	The recoveries were within laboratory QC limits of 70-130% and all RPDs were ≤30%.	No qualifications were required.
8. Field QC FB: None ER: MV654 (SDG 206359) FD: None	The equipment blank had a detect between the MDL and the reporting limit for trichloroethene; however, the reportable concentrations of trichloroethene in the associated site samples exceeded five times the concentration reported in the equipment blank. No other target compounds were	No qualifications were required.

Project: SDG: Analysis: Soil Vapor 206353 VOC

	Findings	Qualifications				
	reported in the equipment blank.					
10. Other	The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration; however, for validation purposes, the reviewer applied the more stringent Method TO-15 criteria of ±40% of the mean initial calibration internal standard area. All internal standard area recoveries were checked from the raw data. The internal standard area was below control limit but >25% of the applicable initial calibration mean area for sample MV612. The internal standard area for sample MV611 was above the control limit.					
	Sample MV612 required lower volume analysis, or "dilution" due to either matrix interference or high concentrations of target compounds. Sample MV611 required reanalysis by full-scan due to high concentrations of target compounds exceeding the calibration range of the SIM method. Only the acceptable dilutions and reanalyses were reported by the laboratory. MDLs and reporting limits were adjusted appropriately for dilution and/or full-scan analysis.					
	Results were reported by the laboratory in both ppbv and units of µg/m³, and in addition, a flux measurement was provided for each result.	Any detects between the MDL and the reporting limit were qualified as estimated, "J."				
	The laboratory reported all nondetects at the MDL; however, at the professional discretion of the reviewer, those results were changed on the sample result summaries to nondetects at the reporting limit (for µg/m³), rather than the MDL.					
Comments	None.	None.				

<sup>&</sup>lt;sup>1</sup> Level IV/V validation consists of cursory review of the summary forms and minimal review of the raw data as necessary. Based on the Level IV report it was determined by the reviewer that additional items required review. The reported values on the summary forms are presumed to be correct and no verification of the values from the raw instrument output is performed. Criteria not reviewed included instrument performance, analytical sequence, initial calibration, continuing calibration, compound identification, and compound quantification.



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborator	SDG: y Number:	206353 01	
File: Description Can/Tube#	: 670			Date F	Received: extracted:	07/19/06 07/21/06	Time:	40.40	
Sam_Type:			0		Analyzed: on Factor:	08/15/06	Time:	18:43	
Air Volume	081506-MS3 e: 500 ml		Cai		x Factor:	1.40	0.0385	3 0.0036 1 Qual	
		MDL	Amount	MDL	RL	Amount	Flux Qu	The second of th	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3 u	g/(m2*min)		_
75-01-4	Vinyl chloride	0.005	0.005	0.014	0.074	0,0148.07	√ 0.0005	U \$	U
75-35-4	1,1-Dichloroethene	0.003	0.003	0.013	0.115	0.0130-แ≾	0.0005		U
156-60-5	trans-1,2-Dichloroethene	0.015	0.015	0.062	0.103	0.0620463	0.0024		U
156-59-2	cis-1,2-Dichloroethene	0.024	0.024	0.097	0.115	0.0970-115	0.0037	VV	Ų
79-01-6	Trichloroethene	0.002	0.005	0.013	0.155	0.027	0.0010	5	J
127-18-4	Tetrachloroethene	0.002	0.013	0.016	0.196	0.093	0.0036	5	J
			Spike Amt	•	Amount		QC	Flag	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected

Surrogate Recovery

Toluene-d8

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

ppbV

0.200

Level Lsq/23/06 IV/V

% Rec.

108

Limits

70-130

\* = Out

ppbV

0.215



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM	AND THE REAL PROPERTY OF THE P				Laborato	SDG ory Number		353 02	
File:	0635302A.D			Date	Sampled:	07/19/06	Time	):		
Descriptio Can/Tube#					Received:	07/21/06				
Sam_Type					Extracted: Analyzed:	08/15/06	Time	ı: 19	9:26	
QC_Batch	: 081506-MS3		Ca		n Factor:	2.16			3	
Air Volum	e: 500 ml			Flu	x Factor:		0.038	5 0.0	036	
								Rev a	احا	
		MDL	Amount	MDL	RL	Amount	Flux			Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min	) \ \		
75-01-4	Vinyl chloride	0.008	0.008	0.022	0.114	0.022011	4 0.0008	U	\$	U
75-35-4	1,1-Dichloroethene	0.005	0.005	0.021	0.177	0.0210.1	77 0.0008		Ì	U
156-60-5	trans-1,2-Dichloroethene	0.023	0.023	0.096	0.159	0,09604	59 0.0037			U
156-59-2	cis-1,2-Dichloroethene	0.037	0.037	0.150	0.177	0.1500.	770.0058	1	$\checkmark$	Ų
79-01-6	Trichloroethene	0.004	0.005	0.020	0.239	0.028	0.0011	=		j
127-18-4	Tetrachloroethene	0.003	0.005	0.024	0.303	0.038	0.0015	7		J
<del></del>			Spike Amt		Amount		QC	Fla	g	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = C	ut	
	Toluene-d8		0.200		0.197	99	70-130			

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

20635302.MS3 Printed on 8/17/2006



LevelNI (csa/27/06

Qual

EPA Method TO-15 SIM GC/MS SDG: 206353
Analytical Method: TO-15 SIM Laboratory Number: 03

File: 0635303A.D Date Sampled: 07/19/06 Time:

Description: MV603 Date Received: 07/21/06

Can/Tube#: 652 Date Extracted:

 QC\_Batch:
 081506-MS3
 Can Dilution Factor:
 2.01
 3

 Air Volume:
 500 ml
 Flux Factor:
 0.0385
 0.0036

		MDL	Amount	MDL	RL	Amount	Flux	Qua/	cde	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min	) `		
75-01-4	Vinyl chloride	0.008	0.008	0.020	0.106	0.0200.10	6 0.0008	Ц	\$	Ų
75-35-4	1,1-Dichloroethene	0.005	0.005	0.019	0.165	0.0190.16	·5 0.0007	1		U
156-60-5	trans-1,2-Dichloroethene	0.022	0.022	0.089	0.148	0.0890.14	8 0.0034	1		U
156-59-2	cis-1,2-Dichloroethene	0.034	0.034	0.139	0.165	0.1390.16	√S 0.0054	<b>V</b>	1	U
79-01-6	Trichloroethene	0.003	0.005	0.018	0.222	0.030	0.0012	5	The state of the s	J
127-18-4	Tetrachloroethene	0.003	0.013	0.023	0.282	0.089	0.0034	5		J
									I	

	Spike Amt.	Amount		QC	Flag	
Surrogate Recovery	ppbV	ppbV	% Rec.	Limits	* = Out	
Toluene-d8	0.200	0.215	108	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

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EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG ory Number		6353 04	
•	File: 0635304A.D  Description: MV604  Can/Tube#: 600  Sam_Type: SA		Date Sampled: Date Received: Date Extracted:			: 07/21/06		:		4
Sam_Type	: SA				•	08/15/06	Time	: 2	0:52	
QC_Batch	: 081506-MS3		Ca	n Dilutic	n Factor:	1.91			3	
Air Volum	e: 500 ml			Flu	x Factor:		0.038	5 0.0	0036	
							R	و ل	Q101	
		MDL	Amount	MDL	RL	Amount	Flux	Qual	wde	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min			-
75-01-4	Vinyl chloride	0.007	0.007	0.019	0.101	0.019	0.0007	JI		J
75-35-4	1,1-Dichloroethene	0.004	0.004	0.018	0.156	0,0180.	≶6 0.0007	u !	\$	U
156-60-5	trans-1,2-Dichloroethene	0.021	0.021	0.085	0.141	0.085∂√	4 ( 0.0033	- Land		U
156-59-2	cis-1,2-Dichloroethene	0.032	0.032	0.132	0.156	0.132 0.1	56 0.0051	1	V	U
79-01-6	Trichloroethene	0.003	0.012	0.017	0.211	0.066	0.0025	J	-	J
127-18-4	Tetrachloroethene	0.003	0.009	0.022	0.268	0.065	0.0025	5		J
	·		Spike Amt	•	Amount		QC	Fla	ıg	-
-	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = (	Out	
	Toluene-d8		0.200		0.221	111	70-130			

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IVI



**EPA Method TO-15 SIM GC/MS** 

Analytical Method:

SDG:

206353

**Laboratory Number:** 

05

File:

0635305A.D

Date Sampled: 07/19/06

Time:

**Description: MV605** 

Date Received: 07/21/06

Can/Tube#: 729

**Date Extracted:** 

Time:

0.0385

15:04

Sam\_Type: SA

Date Analyzed: 08/17/06

QC\_Batch: 081706-MS3

**Can Dilution Factor:** 

1.94

3

Air Volume:

500 ml

Flux Factor:

0.0036

		MDL	Amount	MDL	RL	Amount Flux	Qual	de	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3 ug/(m2*mi	n)		
75-01-4	Vinyl chloride	0.007	0.007	0.019	0.102	0.0190.102.0.0007	L	\$	U
75-35-4	1,1-Dichloroethene	0.005	0.005	0.018	0.159	0.0180.6590.0007			U
156-60-5	trans-1,2-Dichloroethene	0.021	0.021	0.086	0.143	0.0860.1430.0033			U
156-59-2	cis-1,2-Dichloroethene	0.033	0.033	0.134	0.159	0.134 0.159 0.0052	4	4	U
79-01-6	Trichloroethene	0.003	0.019	0.018	0.215	0.105 0.2150.0040	U	B,\$	J
127-18-4	Tetrachloroethene	0.003	0.011	0.022	0.272	0.075 0.0029	T		J

	Spike Amt.	Amount		QC	Flag
Surrogate Recovery	ppbV	ppbV	% Rec.	Limits	* = Out
Toluene-d8	0.200	0.202	101	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

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EPA Method TO-15 SIM GC/MS

Analytical Method:

**TO-15 SIM** 

SDG:

206353

**Laboratory Number:** 

06

File:

0635306A.D

Date Sampled: 07/19/06

Time:

Description: MV606

Can/Tube#: 193

**Date Extracted:** Date Analyzed: 08/17/06

15:43

Sam\_Type: SA

QC\_Batch: 081706-MS3

**Can Dilution Factor:** 1.73

Date Received: 07/21/06

Time:

Air Volume:

500 ml

Flux Factor:

0.0385

0.0036

Rev Dird

		MDL	Amount	MDL	RL	Amount	Flux	Qual	Lock	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*mir	า) ้		•
75-01-4	Vinyl chloride	0.007	0.007	0.017	0.091	0,0170.0	91 0.0007	u	\$	U
75-35-4	1,1-Dichloroethene	0.004	0.004	0.016	0.142	0.0160	142_0.0006	a.		U
156-60-5	trans-1,2-Dichloroethene	0.019	0.019	0.077	0.127	0.0770	27 0.0030			U
156-59-2	cis-1,2-Dichloroethene	0.029	0.029	0.120	0.142	0.1200.	142 0.0046	1	1	U
79-01-6	Trichloroethene	0.003	0.017	0.016	0.191	0.0950.	19 0.0037	u	B. \$	J
127-18-4	Tetrachloroethene	0.003	0.012	0.020	0.243	0.085	0.0033	1		J
			Dmillon A4		A 4					

	Spike Amt.	Amount		QC	Flag
Surrogate Recovery	ppbV	ppbV	% Rec.	Limits	* = Out
Toluene-d8	0.200	0.207	103	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



EPA Metho Analytical I	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG ory Number		-
File: Descriptior Can/Tube#				Date F	Sampled: Received: extracted:		Time	:	
Sam_Type:	: SA			Date /	Analyzed:	08/17/06	Time	: 16:25	5
QC_Batch:	081706-MS3		Ca	n Dilutio	n Factor:	1.74		3	3
Air Volume	e: 500 ml			Flu	x Factor:		0.0385	0.0036	3
							R	les Que	: 1
		MDL	Amount	MDL	RL	Amount	Flux	PV61 60	€ Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min	)	
75-01-4	Vinyl chloride	0.007	0.007	0.017	0.092		<b>℃120.0007</b>	u \$	Ų
75-35-4	1,1-Dichloroethene	0.004	0.004	0.017	0.142	0.0170	420.0007	European Committee	U
156-60-5	trans-1,2-Dichloroethene	0.019	0.019	0.077	0.128	0.0770.	1280.0030	200	U
156-59-2	cis-1,2-Dichloroethene	0.029	0.029	0.121	0.142	0.12101	120.0047	1 1	U
79-01-6	Trichloroethene	0.003	0.023	0.016	0.193	0.125	0.0048	7	J
127-18-4	Tetrachloroethene	0.003	0.012	0.020	0.244	0.081	0.0031	丁	J
			Spike Amt		Amount	h er hafter maken vælder mer villet hav el sem	QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.214	107	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

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EPA Method TO-15 SIM GC/MS SDG: 206353
Analytical Method: TO-15 SIM Laboratory Number: 08

File: 0635308A.D Date Sampled: 07/19/06 Time:

Description: MV601B Date Received: 07/21/06

Can/Tube#: 517 Date Extracted:

 Sam\_Type:
 SA
 Date Analyzed:
 08/17/06
 Time:
 17:08

 QC\_Batch:
 081706-MS3
 Can Dilution Factor:
 5.29
 3

Air Volume: 500 ml Flux Factor: 5.29 3

		MDL	Amount	MDL	RL	Amount	Flux	2041	isde	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min	)		
75-01-4	Vinyl chloride	0.020	0.020	0.053	0.279	0.0530.2	79 0.0020	U	\$	U
75-35-4	1,1-Dichloroethene	0.012	0.012	0.050	0.433	0.0500.4	1530.0019	1		U
156-60-5	trans-1,2-Dichloroethene	0.057	0.057	0.235	0.390	0,2350.9	90.0090	100		U
156-59-2	cis-1,2-Dichloroethene	0.090	0.090	0.367	0.433	0.3670.	330.0141	V	1	U
79-01-6	Trichloroethene	0.009	0.023	0.048	0.585	0.129	0.0050	J		J
127-18-4	Tetrachloroethene	0.009	0.022	0.060	0.742	0.156	0.0060	J		J

	Spike Amt.	Amount		QC	Flag
Surrogate Recovery	ppbV	ppbV	% Rec.	Limits	* = Out
Toluene-d8	0.200	0.186	93	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

143/23/0b Level 1V/V

Wal



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG: ory Number:		
File: Descriptio Can/Tube#				Date I	Sampled: Received: Extracted:				
Sam_Type QC_Batch	: SA : 080606-MS3		Ca		Analyzed: on Factor:	08/06/06 1.36		14:52 3	
Air Volum	e: 500 ml			Flu	ıx Factor:		0.0385 Rev	0.0036	
		MDL	Amount	MDL	RL	Amount	Flux 🍳	ua code	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)		_
79-01-6	Trichloroethene	0.002	0.015	0.012	0.150	0.0850	1500.0033	L B,\$	J
			Spike Amt		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.177	89	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

See 14



EPA Metho Analytical I	d TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG: ory Number:	206353 10	
File: Description Can/Tube#				Date F	Sampled: Received: extracted:				
Sam_Type: QC_Batch:			Cai		Analyzed: n Factor:	08/06/06 1.40		15:36 3	
Air Volume	: 500 ml			Flu	x Factor:		0.0385 Rev	0.0036	
		MDL	Amount	MDL	RL	Amount	Flux 🖓	al sae	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)		_
79-01-6	Trichloroethene	0.002	0.027	0.013	0.155	0.149	0.0057	<i>y</i> 2	J
			Spike Amt.	•	Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.086	43	70-130	*	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Wq. 28.06 Level IVI

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EPA Metho	d TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG: tory Number:	206353 11	
File: Description Can/Tube#				Date F	Sampled: Received: extracted:				
Sam_Type: QC_Batch: Air Volume	080606-MS3		Ca	n Dilutio	Analyzed: on Factor: ix Factor:	08/06/06 1.37		16:20 3 0.0036	
CAS#	Compound	MDL ppby		MDL ug/m3	RL ug/m3	Amount ug/m3	Flux 💐 ug/(m2*min)	1ª Code	Flag
79-01-6	Trichloroethene	0.002	0.005	0.012	0.152		ISJ_0.0010	U. B,\$	J
			Spike Amt		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.185	93	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IXI



EPA Method TO-15 Full Scan GC/MS

Analytical Method:

TO-15

SDG:

Time:

Time:

0.0385

206353

Laboratory Number:

12

File:

0635312A.D

Description: MV611

Can/Tube#: 362

Sam\_Type: SA

QC\_Batch: 081706-MS1

Air Volume:

531 ml

Date Sampled: 07/19/06

Date Received: 07/21/06

Date Extracted:

Date Analyzed: 08/17/06

17:58

2

Can Dilution Factor: Flux Factor: 1.42

0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min	Quel Quel Flag
79-01-6	Trichloroethene	0.17	20.95	0.96	7.62	115.89	4.462	JI
			Spike Amt	•	Amount		QC -	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		10.000		10.268	103	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)





**EPA Method TO-15 SIM GC/MS** 

**Analytical Method:** 

**TO-15 SIM** 

SDG:

206353

**Laboratory Number:** 

13

File:

0635313A.D

Toluene-d8

Description: MV612

Can/Tube#: 697

Sam\_Type: SA

QC\_Batch: 080706-MS3

Air Volume:

200 ml

Date Sampled: 07/19/06

Flux Factor:

0.180

Can Dilution Factor:

Time:

Date Received: 07/21/06

**Date Extracted:** 

Date Analyzed: 08/07/06

90

Time:

17:21

1.38

0.0385 0.0036

-								RW	. Qual
		MDL	Amount	MDL	RL	Amount	Flux	1000	ware Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*mi	n)	
79-01-6	Trichloroethene	0.006	0.031	0.031	0.382	0.1720	3820.0066	ut	8, \$ IJ
	Surrogate Recovery		Spike Amt	•	Amount ppbV	% Rec.	QC Limits	Fla * = 1	•

0.200

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

les 9.22.06 Leve 114

70-130



EPA Meth	od TO-15 SIM GC/MS						SDG:	206353	
Analytical	I Method: TO-15 SIM					Laborat	ory Number:	14	
File:	0635314A.D			Date	Sampled:	07/19/06	Time:		
Description	on: MV613				Received:				
Can/Tube	#: 784			Date E	xtracted:				
Sam_Type	e: SA			Date /	Analyzed:	08/06/06	Time:	18:31	
QC_Batch	ı: 080606-MS3		Ca	n Dilutio	n Factor:	1.40		3	
Air Volum	ne: 500 ml			Flu	x Factor:		0.0385	0.0036	
							Re	w Quel	
		MDL	Amount	MDL	RL	Amount	Flux 🗽 🔾	un we	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)		
79-01-6	Trichloroethene	0.002	0.018	0.013	0.155	0.102 0	\$\$ 0.0039	U B,\$	J
			Spike Amt		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.180	90	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

16 9.23.06 Level 14T



EPA Metho	od TO-15 SIM GC/MS Method: TO-1					Laborat	SDG: ory Number		
File: Descriptio Can/Tube#				Date F	•	07/19/06 07/21/06	Time	:	
Sam_Type QC_Batch:			Ca		Analyzed: on Factor:	08/06/06 1.39	Time	19:14	
Air Volum	e: 500 ml			Flu	x Factor:		0.0385 0	0.0036	
	_	MDL		MDL	RL	Amount	Flux	100 1 1 100 Com	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)		
79-01-6	Trichloroethene	0.002	0.004	0.013	0.154	0.022	54 0.0008	U B,\$	J
			Spike Amt	•	Amount		QC	Flag	
	Surrogate Recover	y	ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.194	97	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Us 9.23.06 Level 14

20635315.MS3 Printed on 8/7/2006



**EPA Method TO-15 SIM GC/MS** SDG: 206353 **Analytical Method: TO-15 SIM** Laboratory Number: 16 File: Date Sampled: 07/19/06 Time: 0635316A.D **Description: MV615** Date Received: 07/21/06 Can/Tube#: 172 **Date Extracted:** Sam\_Type: SA Time: 16:39 Date Analyzed: 08/07/06 QC\_Batch: 080706-MS3 Can Dilution Factor: 1.41 3 Air Volume: 500 ml Flux Factor: 0.0385 0.0036 Qual wak Flag MDL Amount MDL RL Amount Flux 0000 CAS# Compound ppbv ppbv ug/m3 ug/m3 ug/m3 ug/(m2\*min) 0.070 0.156 0.0027 79-01-6 Trichloroethene 0.002 0.013 0.013 0.156 B,\$ Spike Amt. **Amount** QC Flag ppbV Surrogate Recovery ppbV % Rec. Limits \* = Out 0.200 0.166 83 70-130 Toluene-d8

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level 14



12269 East Vassar Drive, Aurora, CO 80014 720.535.5502, Fax 720.535.7555

#### DATA ASSESSMENT FORM

Project Title: Vapor Migration Study

Project Manager: D. Hambrick

Analysis/Method: EPA Method TO-15

QC Level: IV/V<sup>1</sup>
SDG: 206373
Matrix: Air

No. of Samples: 10

No. of Reanalyses/Dilutions: 0

Date Reviewed: September 24, 2006

Reviewer: L. Calvin

Reference: MECX Data Validation Procedure for Volatile Organics (DVP-2,

Rev. 0), EPA Method TO-15 (1/99), and USEPA Contract Laboratory Program National Functional Guidelines for Organic

Data Review (2/94)

Samples Reviewed: MV641, MV642, MV643, MV644, MV645, MV646, MV647,

MV648, MV649, MV650

#### **Data Validation Findings**

	Findings	Qualifications
1. Sample Management	According to the case narrative for this SDG, the samples were received intact and in good condition, with acceptable canister pressures. The laboratory also provided canister QC certification records for the batches of canisters utilized. The COC was signed and dated by appropriate field and laboratory personnel, and accounted for the samples and analyses presented in this SDG. Although the COC indicated all samples were collected in Summa canisters, the sample result summary for sample MV650 indicated the sample was collected in a Tedlar bag. The laboratory confirmed that the COC was correct. The sample result summary was corrected by the reviewer.  The air samples were analyzed within 30 days of collection.	No qualifications were required.

Project: Soil SDG: 20 Analysis:

Soil Vapor 206373 VOC

	Findings	Qualifications
3. <u>Calibration</u>	The initial calibration %RSDs and the continuing calibration %Ds were within the method QC limit of ≤30%, with the exception of a %D >30% for vinyl chloride in the continuing calibration analyzed 08/22/06.	As the only sample associated with the %D outlier was identified as a field QC sample, no qualifications were required.
4. Method Blanks 081706-MS1 082206-MS3 082506-MS3 082606-MS3	Four method blanks were analyzed with the samples in this SDG. The laboratory also supplied canister QC certification blanks for all canisters used in this SDG. Trichloroethene was detected between the MDL and the reporting limit in method blank 082206-MS3; however, the detect for trichloroethene in associated sample MV647 exceeded five times the method blank concentration. No target compounds were detected in the remaining method blanks or the canister QC certification blanks.	No qualifications were required.
5. <u>LCS/LCSD</u> 081706-MS1 082206-MS3 082506-MS3 082606-MS3	In the LCS only of 082206-MS3, trichloroethene was recovered below the QC limits but ≥10%, and in the LCSD only, vinyl chloride was recovered above the QC limits. All remaining LCS/LCSD recoveries were within the laboratory QC limits of 70-130%, and all RPDs were within the QC limit of ≤30%.	No qualifications were required.
6. <u>Surrogates</u>	The surrogate was recovered within the laboratory QC limits of 70-130% for all samples.	No qualifications were required.
7. <u>MS/MSD</u> <sub>MV642</sub>	In the MSD only, trichloroethene was recovered above the QC limits. The remaining MS/MSD recoveries were within laboratory QC limits of 70-130% and all RPDs were within the QC limit of ≤30%.	No qualifications were required.
8. Field QC FB: None ER: MV647 FD: MV641/MV643	The equipment blank had detects between the MDL and the reporting limit for vinyl chloride and 1,1-dichloroethene, and detects above the reporting limits for all remaining target compounds. Most target compound concentrations in the site samples exceeded five times the equipment blank concentrations; however, the exceptions were qualified as noted.	The following detects were qualified as estimated, "J." 1,1-dichloroethene and trichloroethene in MV641, tetrachloroethene in MV642, MV643, and MV644, trichloroethene and tetrachloroethene in sample MV645, trans- and cis-1,2-dichloroethene and tetrachloroethene in sample MV646, and trichloroethene in sample MV646, and trichloroethene in sample MV648.

Project: Soil Vapor SDG: 206373 Analysis: VOC

	Findings	Qualifications
8. Field QC (cont.) FB: None ER: MV647 FD: MV641/MV643	The field duplicate samples had a common detect above the reporting limit for trichloroethene; with an RPD of approximately 193%. Vinyl chloride and tetrachloroethene were detected below the reporting limits and trans- and cis-1,2-dichloroethene were detected above the reporting limits in MV643 but were not detected in MV641.	No qualifications were required.
10. <u>Other</u>	The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration; however, for validation purposes, the reviewer applied the more stringent Method TO-15 criteria of ±40% of the mean initial calibration internal standard area to evaluate samples. The internal standard was within the control limits for samples MV647 and MV649, and below the control limits for all remaining samples.	All results were qualified as estimated, "J," for detects and "UJ," for nondetects in samples MV641, MV642, MV643, MV644, MV645, MV646, MV648, and MV650.
	Sample MV649 required analysis by full-scan method due to high concentrations of target compounds exceeding the calibration range of the SIM method, and the full-scan analysis was performed at a lower volume, or "dilution." All remaining samples analyzed by SIM also required significant diluations for target compounds. Only the acceptable dilutions and reanalyses were reported by the laboratory. MDLs and reporting limits were adjusted appropriately for dilution and/or full-scan analysis.	
	The laboratory reported all nondetects at the MDL; however, at the professional discretion of the reviewer, those results were changed on the sample result summaries to nondetects at the reporting limit (for µg/m³), rather than the MDL.	
	Results were reported by the laboratory in both ppbv and units of $\mu g/m^3$ . The reviewer noted that the laboratory reported results to three decimal places, rather than to three significant figures.	Detects reported between the MDL and the reporting limit were qualified as estimated, "J."

Project: SDG: Analysis:

Soil Vapor 206373 VOC

	Findings	Qualifications
10. Other (cont.)	Isopropanol leak tests were performed on all of the site samples in this SDG to demonstrate efficiency of the sampling procedure. Isopropanol was detected in samples MV641, MV645, and MV646.	Results for samples MV641, MV645, and MV646 were qualified as estimated, "J," for detects and "UJ," for nondetects.
Comments	None.	None.

Level IV/V validation consists of cursory review of the summary forms and minimal review of the raw data as necessary. Based on the Level IV report it was determined by the reviewer that additional items required review. The reported values on the summary forms are presumed to be correct and no verification of the values from the raw instrument output is performed. Criteria not reviewed included instrument performance, analytical sequence, initial calibration, continuing calibration, compound identification, and compound quantification.



EPA Method TO-15 SIM GC/MS	A A A A A A A A A A A A A A A A A A A					SDG:	206373
Analytical Method: TO-15 SIM	:				Laboratory	Number:	01
File: 0637301B.D			Date	Sampled:	07/27/06	Time:	8:03
Description: MV641			Date	Received:	07/28/06		
Can/Tube#: 643			Date	Extracted:			
Sam_Type: SA QC_Batch: 082606-MS3				Analyzed:	08/26/06	Time:	20:02
Air Volume: 5 ml				on Factor:	1.92		2
All Volume. 5 m			Not Dete	cted Flag:	U		
	MDL	RL	Amount	MDL	RL	Amount	Flag
CAS# Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	riagy
75-01-4 Vinyl chloride	0.72	3.84	0.72	1.91	10.14	1.91 10	14 1 15
75-35-4 1,1-Dichloroethene	0.45	3.84	2.37	1.82	15.71	9.72	J
156-60-5 trans-1,2-Dichloroethene	2.08	3.46	2.08	8.53	14.15	-8:53 14.	- 4
156-59-2 cis-1,2-Dichloroethene	3.25	3.84	3.25	13.30	15.71	13:30 15	
79-01-6 Trichloroethene	0.31	3.84	38.14	1.74	21.24	210.97	T
127-18-4 Tetrachloroethene	0.31	3.84	0.31	2.17	26.92	2.1726.	72 U UT
		Spike Am	t.	Amount		QC	Flag
Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
Toluene-d8		0.200		0.208	104	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20637301.MS3

Printed on 8/28/2006

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(16)

Surrogate Recovery

Toluene-d8



EPA Meth Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG: ry Number:	206373 02
File: Description Can/Tuber				Date	Sampled: Received: Extracted:	07/27/06 07/28/06	*******	8:14
Sam_Type QC_Batch Air Volum	: 082506-MS3			Date Can Diluti	Analyzed: on Factor: ected Flag:	08/25/06 2.18 U	Time:	18:37 2
CAS#	Compound	MDL	RL	Amount	MDL	RL	Amount	Flag
75-01-4	Vinyl chloride	ppbv 4.11	ppbv 21.80	ppbv 4.11	ug/m3 10.85	ug/m3 57.54	ug/m3 10:85 < 7	54U LOT
75-35-4 156-60-5	1,1-Dichloroethene trans-1,2-Dichloroethene	2.53 11.83	21.80 19.62	246.75 38.49	10.35 48.43	89.21 80.32	1,009.72 157.55	7
156-59-2 79-01-6	cis-1,2-Dichloroethene Trichloroethene	18.46	21.80	166.50	75.53	89.21	681.34	
127-18-4	Tetrachloroethene	1.78 1.76	21.80 21.80	2,115.58 3.75	9.86 12.33	120.60 152.82	11,703.57 26.28	J +
	Surrogate Recovery		Spike Am	t.	Amount	0.5	QC	Flag

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

3) MDL and RL are adjusted for sample volume and can dilution.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

ppbV

0.200

ppbV

0.213

% Rec.

107

Report File Name: 20637302.MS3 Printed on 8/26/2006

Environmental Analytical Service Page 1 of 1

MC 09.24.04 Level II/V

\* = Out

Limits

70-130

(17)



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG: ory Number:	206373 03
File: Descriptio Can/Tuber				Date	Sampled: Received: Extracted:	07/27/06 07/28/06		8:14
Sam_Type QC_Batch Air Volume	: 082506-MS3			Can Diluti	Analyzed: on Factor: cted Flag:	08/25/06 2.24 U		20:31 2
040#		MDL	RL	Amount	MDL	RL	Amount	Flag
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	Lyou
75-01-4	Vinyl chloride	4.23	22.40	10.03	11.15	59.12	26.47	J T
75-35-4	1,1-Dichloroethene	2.60	22.40	276.20	10.64	91.66	1,130.25	1
156-60-5	trans-1,2-Dichloroethene	12.16	20.16	26.69	49.77	82.53	109.26	3
156-59-2	cis-1,2-Dichloroethene	18.97	22.40	188.67	77.61	91.66	772.06	
79-01-6	Trichloroethene	1.83	22.40	2,226.16	10.13	123.92	12,315.35	
127-18-4	Tetrachloroethene	1.81	22.40	5.34	12.67	157.03	37.47	J √
	Surrogate Recovery		Spike Am ppbV	t.	Amount ppbV	% Rec.	QC Limits	Flag
	Toluene-d8		0.200		0.208	104	70-130	* = Out

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20637303.MS3 Printed on 8/26/2006

(18)

Environmental Analytical Service Page 1 of 1

MC 09.24.06 Leve (II/U



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG: ry Number:	206373 04
File: Descriptio	0637304A.D n: MV644				Sampled: Received:	07/27/06 07/28/06	Time:	10:50
Can/Tuber	: SA			Date i Date	Extracted: Analyzed:	08/25/06	Time:	21:13
Air Volume	: 082506-MS3 e: 1 mi			Can Dilution Not Dete	on Factor: cted Flag:	1.69 U		2
		MDL	RL	Amount	MDL	RL.	Amount	Flag
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ava
75-01-4	Vinyl chloride	3.19	16.90	3.23	8.41	44.61	8.53	J
75-35-4	1,1-Dichloroethene	1.96	16.90	1.96	8.02	69.16	8.0269.	14 U UT
156-60-5	trans-1,2-Dichloroethene	9.17	15.21	14.04	37.55	62.27	57.48	JI
156-59-2	cis-1,2-Dichloroethene	14.31	16.90	109.35	58.55	69.16	447.45	
79-01-6	Trichloroethene	1.38	16.90	1,324.15	7.64	93.49	7,325.31	No. of Contrast
127-18-4	- Tetrachloroethene	1.36	16.90	2.66	9.56	118.47	18.62	J 🎶
	6		Spike Am	ţ.	Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.228	114	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20637304.MS3 Printed on 8/26/2006

(19)

Level II/U

Environmental Analytical Service Page 1 of 1



EPA Method TO-15 SIM GC/MS Analytical Method: TO-15 SIM	SDG: 206373 Laboratory Number: 05	
File: 0637305A.D  Description: MV645  Can/Tube#: 621	Date Sampled: 07/27/06 Time: 10:59 Date Received: 07/28/06 Date Extracted:	ř
Sam_Type: SA QC_Batch: 082606-MS3 Air Volume: 10 ml	Date Analyzed: 08/26/06 Time: 13:25 Can Dilution Factor: 1.55 2 Not Detected Flag: U	

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag√
75-01-4	Vinyl chloride	0.29	1.55	0.29	0.77	4.09	0.77 4 .0	9 U KJ
75-35-4	1,1-Dichloroethene	0.18	1.55	0.18	0.74	6.34	0.74 6.3	
156-60-5	trans-1,2-Dichloroethene	0.84	1.40	0.84	3.44	5.71	3.44 5	
156-59-2	cis-1,2-Dichloroethene	1.31	1.55	1.31	5.37	6.34	-5:37 V	
79-01-6	<ul> <li>Trichloroethene</li> </ul>	0.13	1.55	22.23	0.70	8.57	122.96	1
127-18-4	Tetrachloroethene	0.13	1.55	0.42	0.88	10.87	2.92	JV
			Spike Amt.		Amount	<del></del>	QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200	William Danielle	0.207	104	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20637305.MS3 Printed on 8/28/2006

Environmental Analytical Service Page 1 of 1

AC 09.24.06 Level II/I

(20)



EPA Method TO-15 SIM GC/MS Analytical Method: TO-15 SIM					Laboratory	SDG: / Number:	206373 06
File: 0637306A.D Description: MV646 Can/Tube#: 657			Date	Sampled: Received: Extracted:	07/27/06 07/28/06	Time:	12:23
Sam_Type: SA QC_Batch: 082606-MS3 Air Volume: 10 ml			Can Diluti	Analyzed: on Factor: cted Flag:	08/26/06 1.63 U	Time:	14:10 2
CAS# Compound 75-01-4 Vinyl chloride	MDL ppbv 0,31	RL ppbv 1.63	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75-35-4 1,1-Dichloroethene 156-60-5 trans-1,2-Dichloroethene 156-59-2 cis-1,2-Dichloroethene	0.19 0.88	1.63 1.47	0.31 0.19 3.64	0.81 0.77 3.62	4.30 6.67 6.01	0.814.3 0.77 b.1 14.88	50 U U J F
79-01-6 Trichloroethene 127-18-4 Tetrachloroethene	1.38 0.13 0.13	1.63 1.63 1.63	11.97 176.19 0.42	5.65 0.74 0.92	6.67 9.02 11.43	48.98 974.72 2.94	J
Surrogate Recovery Toluene-d8		Spike Am ppbV 0.200	t.	Amount ppbV 0.211	% Rec. 105	QC Limits 70-130	Flag * = Out

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09. 24.06 Level II/I

Environmental Analytical Servic Page 1 of

Report File Name: 20637306.MS3 Printed on 8/28/2006

# ENVIRONMENTAL Analytical Service, Inc.

ER

EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborator	SDG: y Number:	20637: 07	_
File:	0637307A.D	and the second s			Sampled:	07/27/06		10:58	В
Descriptio Can/Tube					Received:	07/28/06			
Sam_Type					Extracted:	00/00/00			_
	. 082206-MS3				Analyzed: on Factor:	08/22/06		15:32	
Air Volume					cted Flag:	1.35 U		•	3 year
		MDL	RL	Amount	MDL	RL	Amount	Flag	70
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3		in and the second
75-01-4	Vinyl chloride	0.255	1.350	0.433	0.672	3.563	1.144	J	
75-35-4	1,1-Dichloroethene	0.157	1.350	0.953	0.641	5.524	3.901	J	1
156-60-5	trans-1,2-Dichloroethene	0.733	1.215	2.397	2.999	4.974	9.815	·	V
156-59-2	cis-1,2-Dichloroethene	1.143	1.350	5.902	4.677	5.524	24.152		
79-01-6	Trichloroethene	0.110	1.350	21.208	0.610	7.468	117.325		
127-18-4	Tetrachloroethene	0.109	1.350	3.061	0.763	9.464	21.456		
***************************************	_		Spike Amt	•	Amount		QC	Flag	- 1
4	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8	ļ	0.200		0.260	130	70-130	····	-

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level II

MC 09.24.06

Environmental Analytical Service Page 1 of 1



Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM					Laboratory	SDG: y Number:	206373 08
File: Descriptio Can/Tube	<b>#</b> : 407			Date	Sampled: Received: Extracted:	07/27/06 07/28/06	Time:	13:49
Sam_Type QC_Batch Air Volum	: 082606-MS3			Can Diluti	Analyzed: on Factor: cted Flag:	08/26/06 1.71 U	Time:	19:22 2
	Compound	MDL ppbv	RL ppbv	Amount	MDL	RL	Amount	Flag
'5-01-4 '5-35-4	Vinyl chloride 1,1-Dichloroethene	0.65 0.40	3.42 3.42	0.65	ug/m3 1.70	ug/m3 9.03	ug/m3 1.70 9 · 0	
56-60-5 56-59-2	trans-1,2-Dichloroethene	1.86	3.08	0.40 1.86	1.62 7.60	13.99 12.60	1.62 1%. 7.60 12.	600 I
9-01-6	cis-1,2-Dichloroethene Trichloroethene	2.90 0.28	3.42 3.42	2.90 99.80	11.85 1.55	13.99 18.92	14.85 13. 552.08	T
127-18-4	Tetrachloroethene	0.28	3.42 Spike Amt	0.28	1.93 Amount	23.97	1.93 23.	
	Surrogate Recovery Toluene-d8		ppbV	L•	ppbV	% Rec.	QC Limits	Flag * = Out
	i diuelle-do		0.200		0.204	102	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20637308.MS3 Printed on 8/28/2006

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EPA Methon	od TO-15 Full Scan GC/MS Method: TO-15					Laborator	SDG: y Number:	206373 09	
File:	0637309A.D			Date	Sampled:	07/27/06	Time:	13:58	
Description				Date	Received:	07/28/06			
Can/Tuber	#: 731			Date I	Extracted:				
Sam_Type				Date	Analyzed:	08/17/06	Time:	21:44	
QC_Batch	: 081706-MS1			Can Dilutio	on Factor:	1.61		0	
Air Volume	e: 0.05 ml			Not Dete	cted Flag:	U		1	
		MDL	RL	Amount	MDL	RL	Amount	Flag	wa) e
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	95	9000
75-01-4	Vinyl chloride	1,513	16,422	1,513	3,994	43,344	3,994	344U IL	4
75-35-4	1,1-Dichloroethene	2,447	16,744	2,447	10,014	68,517	10,014		
156-60-5	trans-1,2-Dichloroethene	10,014	14,168	10,014	40,996	58,000	40,996		
156-59-2	cis-1,2-Dichloroethene	1,707	16,583	1,707	6,984	67,859	6,98467	259U √	1
79-01-6	Trichloroethene	2,093	16,583	262,976	11,579	91,739	1,454,810		
127-18-4	Tetrachloroethene	1,320	16,583	1,320	9,255	116,249	9,255116	249U U	\$
			Spike Amt	•	Amount	****	QC	Flag	•
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		10.000		9.890	99	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.24.06 Level II/I

Environmental Analytical Service Page 1 of 1

20637309.MS1 Printed on 8/18/2006



EPA Meth Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborator	SDG: y Number:	206373 10
File:	0637310B.D			Date	Sampled:	07/27/06	Time:	15:22
Description	on: MV650			Date	Received:	07/28/06		
Can/Tube	#: <del>TBAG</del> -618			Date I	Extracted:			
Sam_Type	e: SA				Analyzed:	08/26/06	Time:	20.44
OC Batch	: 082606-MS3				•		nine:	20:41
				Can Dilution	on Factor:	161.00		0
Air Volum	e: 0.5 ml			Not Dete	cted Flag:	U		
					_			Y
		MDL	RL	Amount	MDL	RL	Amount	Flag
CAS#	Compound	ppby	ppbv	ppbv	ug/m3	ug/m3	ug/m3	940 920
75-01-4	Vinyl chloride	607	3,220	607	1.603	8 499	1,603 44	9911177

	_	MDL	RL	Amount	MDL	RL	Amount	Flag
CAS#	Compound	ppby	ppbv	ppbv	ug/m3	ug/m3	ug/m3	an.
75-01-4	Vinyl chloride	607	3,220	607	1,603	8,499		499U XJ
75-35-4	1,1-Dichloroethene	374	3,220	374	1,529	13.176	1,529	
156-60-5	trans-1,2-Dichloroethene	1,748	2,898	1,748	7,154	11,864	7.154 11	
156-59-2	cis-1,2-Dichloroethene	2,726	3,220	2,726	11.156	13,176	11,156	
79-01-6	Trichloroethene	263	3,220	155,518	1,456	17.813	860.340	T
127-18-4	Tetrachloroethene	260	3,220	260	1,821	22,573	,	573U UT
			Spike Amt.		Amount	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.202	101	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.24.04 Level II/I

Environmental Analytical Service Page 1 of 1



12269 East Vassar Drive, Aurora, CO 80014 720.535.5502, Fax 720.535.7555

#### DATA ASSESSMENT FORM

Project Title: Vapor Migration Study

Project Manager: D. Hambrick

Analysis/Method: EPA Method TO-15

QC Level: IV/V1

SDG: 206359

Matrix: Air

No. of Samples: 1

No. of Reanalyses/Dilutions: 0

Date Reviewed: September 24, 2006

Reviewer: K. Shadowlight

Reference: MECX Data Validation Procedure for Volatile Organics (DVP-2,

Rev. 0), EPA Method TO-15 (1/99), and USEPA Contract

Laboratory Program National Functional Guidelines for Organic

Data Review (2/94)

Samples Reviewed: MV654

#### **Data Validation Findings**

	Findings	Qualifications
1. <u>Sample</u> <u>Management</u>	According to the case narrative for this SDG, the sample was received intact and in good condition, with an acceptable canister pressure. The laboratory also provided a canister QC certification records for the canister utilized. No problems were noted regarding sample handling and transport.	No qualifications were required.
	The COC was signed and dated by appropriate field and laboratory personnel, and accounted for the sample and analysis presented in this SDG. According to a memo from MWH personnel, dated 08/30/06, the EPA ID for sample MV624 was changed to MV654.	
	The air sample was analyzed within 30 days of collection.	

Project: S SDG: Analysis:

Soil Vapor 206359 VOC

	Findings	Qualifications
3. <u>Calibration</u>	The %RSDs for the initial calibrations and the %Ds for the continuing calibrations were all within the control limit of ≤30%.	No qualifications were required.
4. Method Blanks 081506-MS3	There was one method blank analyzed in association with the sample in this SDG. The laboratory also supplied a canister QC certification blank for the canister used in this SDG. No target compounds were detected in the canister QC certification blank. There were no target compounds reported in the method blank.	No qualifications were required.
5. <u>LCS/LCSD</u> 081506-MS3	One LCS/LCSD pair was analyzed with the sample in this SDG. Spiked target compound tetrachloroethene was recovered above QC limits in the LCS only. All remaining recoveries were within the QC limits, and all RPDs were within the QC limit of ≤30%.	No qualifications were required.
6. <u>Surrogates</u>	The surrogates recoveries were within the method-established control limits of 70-130%.	No qualifications were required.
7. MS/MSD MV654	MS/MSD analyses were performed on sample MV654. The sample was identified as field QC and was not further evaluated.	No qualifications were required.
8. Field QC FB: None ER: MV654 FD: None	Trichloroethene was reported in the equipment blank at a concentration of 0.027ug/m3.	No qualifications were required.
10. Other	The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration; however, for validation purposes, the reviewer applied the more stringent Method TO-15 criteria of ±40% of the mean initial calibration internal standard area. All internal standard area recoveries were checked from the raw data.	No qualifications were required
	Results were reported by the laboratory in both ppbv and units of µg/m³, and in addition, a flux measurement was provided for each result. The reviewer noted that the laboratory reported results	Any detects between the MDL and the reporting limit were qualified as estimated, "J."

Project: Soil Vapor SDG: 206359 Analysis: VOC

	Findings	Qualifications
Other (cont.)	to three decimal places, rather than to three significant figures.  The laboratory reported all nondetects at the MDL; however, at the professional discretion of the reviewer, those results were changed on the sample result summaries to nondetects at the reporting limit (for µg/m³), rather than the MDL.	
Comments	None.	None.

Level IV/V validation consists of cursory review of the summary forms and minimal review of the raw data as necessary. Based on the Level IV report it was determined by the reviewer that additional items required review. The reported values on the summary forms are presumed to be correct and no verification of the values from the raw instrument output is performed. Criteria not reviewed included instrument performance, analytical sequence, initial calibration, continuing calibration, compound identification, and compound quantification.



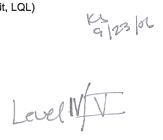
EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG ory Numbe		6359 01	
File:	0635901A.D				Sampled:	07/24/06	Time		11:30	
Can/Tube#	±: 688			Date E	Received: Extracted:					
Sam_Type QC Batch:			Са		Analyzed: on Factor:	08/15/06 1.32		):	18:00	
Air Volume		*			ıx Factor:		0.038	-	0036 Qual	
		MDL	Amount	MDL	RL	Amount	Flux 🕆	101		Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min	1)		
75-01-4	Vinyl chloride	0.005	0.005	0.013	0.070	0.0130.	√ <sub>0</sub> 0.0005	u	\$	U
75-35-4	1,1-Dichloroethene	0.003	0.003	0.013	0.108	0.0130.	108 0.0005	I	\$	U
156-60-5	trans-1,2-Dichloroethene	0.014	0.014	0.059	0.097	0.0590.	0170.0023		\$	U
156-59-2	cis-1,2-Dichloroethene	0.022	0.022	0.091	0.108	0.0910.	08 0.0035	$\checkmark$	\$	U
79-01-6	Trichloroethene	0.002	0.005	0.012	0.146	0.027	0.0010	7		J
127-18-4	Tetrachloroethene	0.002	0.002	0.015	0.185	0.0150	\$5 0.0006	u	\$	U
			Spike Amt	•	Amount		QC	FI	ag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	*=	Out	
	Toluene-d8		0.200		0.194	97	70-130			

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)





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#### DATA ASSESSMENT FORM

Project Title: Vapor Migration Study

Project Manager: D. Hambrick

Analysis/Method: EPA Method TO-15

QC Level: IV/V1

SDG: 206355

Matrix: Air

No. of Samples: 8

No. of Reanalyses/Dilutions: 0

Date Reviewed: September 24, 2006

Reviewer: K. Shadowlight

Reference: MEC<sup>X</sup> Data Validation Procedure for Volatile Organics (DVP-2,

Rev. 0), EPA Method TO-15 (1/99), and USEPA Contract

Laboratory Program National Functional Guidelines for Organic

Data Review (2/94)

Samples Reviewed: MV616, MV617, MV618, MV619, MV620, MV621, MV622, MV623

#### **Data Validation Findings**

	Findings	Qualifications
1. Sample Management	According to the case narrative for this SDG, the samples were received intact and in good condition, with acceptable canister pressures. The laboratory also provided canister QC certification records for the batches of canisters utilized. No problems were noted regarding sample handling and transport.  The COC was signed and dated by appropriate field and laboratory personnel, and accounted for the samples and analyses presented in this SDG.  The air samples were analyzed within 30 days of collection.	No qualifications were required.

Project: SDG: Analysis: Soil Vapor 206355 VOC

			7
		Findings	Qualifications
3. <u>Calibration</u>	and the %Ds	for the initial calibrations for the continuing vere all within the control	No qualifications were required.
4. Method Blanks 081706-MS3 081806-MS3	analyzed in a samples in the also supplied blanks for bo SDG. No tar	wo method blanks association with the his SDG. The laboratory I canister QC certification th canisters used in this get compounds were he canister QC certification	No qualifications were required.
	had detects the and the MDL Target composite also reported MV617 at control	ks from both QC batches between the reporting limit for trichloroethene. bound trichloroethene was in samples MV616 and incentrations less than five thod blank concentration.	Results for trichloroethene reported between the MDL and reporting limit in samples MV616 and MV617 were qualified as nondetects, "U," at the reporting limit.
5. <u>LCS/LCSD</u> 081706-MS3 081806-MS3	with the sample recoveries we QC limits of 7	SD pairs were analyzed ples in this SDG. The ere within the laboratory 70-130% and all RPDs ne QC limit of ≤30%.	No qualifications were required.
6. <u>Surrogates</u>		e recoveries were within stablished control limits of	No qualifications were required.
7. <u>MS/MSD</u> MV616	compound tri	es for spiked target chloroethene were within climits of 70-130% and the 0%.	No qualifications were required.
8. Field QC FB: None ER: MV654 (SDG 206359) FD: MV590 (SDG 206348) and MV622	between the for trichloroet also had a de reported between their reportable cotrichloroether samples excencentration blank. No other trichloroether samples excencentration blank.	ant blank had a detect MDL and the reporting limit thene. Sample MV622 etect for trichloroethene ween the MDL and the t. The remaining ncentrations of the in the associated site eeded five times the reported in the equipment the rarget compounds were the equipment blank.	The detect for trichlorethene in sample MV622 was qualified as estimated, "J."
	Trichloroethe	ne was reported at a	No further qualifications were

Project: Soil Vapor SDG: 206355 Analysis: VOC

		Findings	Qualifications
	concentration reporting limit however, the	ne was reported at a between the MDL and the in sample MV622; detect in sample MV590 table due to method blank	No further qualifications were required.
10. <u>Other</u>	criteria of -50% standard area continuing cali validation purp the more string of ±40% of the internal standard area from the raw d area was below the applicable area for sampl Results were rin both ppbv a	eported by the laboratory nd units of µg/m³, and in	The detect for trichloroethene in sample MV623 was qualified as estimated, "J."  Any detects reported between the MDL and the reporting limit
	The laboratory the MDL; howe discretion of th were changed	reported all nondetects at ever, at the professional e reviewer, those results on the sample result nondetects at the reporting	were qualified as estimated, "J."
Comments		), rather than the MDL.	None.

Level IV/V validation consists of cursory review of the summary forms and minimal review of the raw data as necessary. Based on the Level IV report it was determined by the reviewer that additional items required review. The reported values on the summary forms are presumed to be correct and no verification of the values from the raw instrument output is performed. Criteria not reviewed included instrument performance, analytical sequence, initial calibration, continuing calibration, compound identification, and compound quantification.



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG: ory Number:	206355 01	
File: Descriptio Can/Tube#				Date F	-	07/21/06 07/24/06		7:46	
Sam_Type	: SA			Date A	Analyzed:	08/17/06	Time:	17:51	
	: 081706-MS3		Car	n Dilutio	n Factor:	1.42		3	
Air Volum				Flu	x Factor:		0.0385	0.0036	
							00	1 Del	
CAS#	Compound	MDl. ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Val isde	Flag
79-01-6	Trichloroethene	0.002	0.020	0.013	0.157	0.109 8	1570.0042	IL Bi\$	J
			Spike Amt		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.205	102	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

165 9/23/66

Level IVI



EPA Metho Analytical I	d TO-15 SIM GC/MS Method: TO-15 SIM					Laborate	SDG: ory Number:	206355 02	
File: Description Can/Tube#				Date F	•	07/21/06 07/24/06	Time:	8:31	
Sam_Type:	SA			Date A	Analyzed:	08/17/06	Time:	18:37	
	081706-MS3		Car	n Dilutio	n Factor:	1.45		.3	
Air Volume				Flu	x Factor:		0.0385	0.0036	
							R	er Duc	1
		MDL	Amount	MDL	RL	Amount	Flux (	Flid Cite	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)		
79-01-6	Trichloroethene	0.002	0.009	0.013	0.160	0.052	1600.0020	UB,\$	J
			Spike Amt.		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.211	106	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV I



EPA Metho	od TO-15 SIM GC/MS						SDG:	206355
Analytical	Method: TO-15 SIM					Laborat	ory Number:	03
File:	0635503A.D			Date 5	Sampled:	07/21/06	Time:	9:26
Description					Received:			
Can/Tube#				Date E	xtracted:			
Sam_Type				Date A	Analyzed:	08/17/06	Time:	19:21
	: 081706-MS3		Cai		n Factor:	1.40		3
Air Volume				Flu	x Factor:		0.0385	0.0036
							R	W Ovel
		MDL	Amount	MDL	RL	Amount	Flux	Val Lode Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)	
79-01-6	Trichloroethene	0.002	0.031	0.013	0.155	0.172	0.0066	
			Spike Amt		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.186	93	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

LevelIVI



EPA Method Analytical M	d TO-15 SIM GC/MS Method: TO-15 SIM					Laborate	SDG: ory Number:	206355 04
File: Description Can/Tube#:				Date R	Sampled: Received: xtracted:	07/21/06 07/24/06	Time:	10:16
Sam_Type: SA				Date A	nalyzed:	08/18/06	Time:	14:40
QC_Batch: 081806-MS3			Can Dilution Factor:			1.45		3
Air Volume	: 500 ml			Flu	x Factor:		0.0385	0.0036
		MDL	Amount	MDL	RL	Amount	Flux	Key   Kual Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)	Pust bale
79-01-6	Trichloroethene	0,002	0.030	0.013	0.160	0.166	0.0064	
·			Spike Amt		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.173	87	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

LevelIT



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborate	SDG: ory Number:	206355 05
File: 0635505A.D  Description: MV620  Can/Tube#: 822			Date Sampled: Date Received: Date Extracted:				Time:	10:17
Sam_Type: SA				Date A	Analyzed:	08/17/06	Time:	20:55
QC_Batch: 081706-MS3			Can Dilution Factor:			1.37		3
Air Volum				Flu	x Factor:		0.0385	0.0036
		MDL	Amount	MDL	RL	Amount	Flux	bus ude Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)	Q s
79-01-6	Trichloroethene	0.002	0.074	0.012	0.152	0.407	0.0157	
			Spike Amt	•	Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.208	104	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

LevelM



EPA Metho Analytical I	d TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG: ory Number:	206355 06	
File: Description Can/Tube#				Date F	•	07/21/06 07/24/06	Time:	11:10	
Sam_Type: QC_Batch: Air Volume	: SA 081706-MS3		Ca	n Dilutio	Analyzed: n Factor: x Factor:	08/17/06 1.49		21:37 3 0.0036	Q.
CAS#	Compound	MDL ppby		MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Just wide	Flag
79-01-6	Trichloroethene	0.002	0.029	0.013	0.165	0.162	0.0062	J	J
			Spike Amt	•	Amount		QC	Flag	-
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.224	112	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IVI



	EPA Method TO-15 SIM GC/MS Analytical Method: TO-15 SIM					Laborat	SDG: ory Number:		
File: Descriptio Can/Tube#				Date F	Sampled: Received: xtracted:	07/21/06 07/24/06	Time:	11:16	
Sam_Type: SA QC_Batch: 081806-MS3 Air Volume: 500 ml			Date Analyzed: Can Dilution Factor: Flux Factor:				0.0385	3 0.0036	
CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3		Qual walk	Flag
79-01-6	Trichloroethene	0.002	0.021	0.013	0.154	0.116	0.0045	JF	J
			Spike Amt	•	Amount		QC	Flag	-
	Surrogate Recovery	:	ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.208	104	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

LevefIVI



	EPA Method TO-15 SIM GC/MS Analytical Method: TO-15 SIM					Laborat	SDG: ory Number:	206355 08
File: Descriptio Can/Tube#				Date F	•	07/21/06 07/24/06		11:17
Sam_Type	Sam_Type: SA				•	08/18/06		16:00
QC_Batch	QC_Batch: 081806-MS3		Ca	n Dilutio	n Factor:	1.37		3
Air Volum	e: 500 ml			Flu	x Factor:		0.0385	0.0036
							Re	er Oval
CAS#	Compound	MDL ppb/		MDL ug/m3	RL ug/m3	Amount ug/m3	Flux (ug/(m2*min)	Just sole Flag
79-01-6	Trichloroethene	0.002		0.012	0.152	0.231	0.0089	JI
			Spike Amt		Amount		QC	Flag
	Surrogate Recovery	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.226	113	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

LevelIFT

### CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

Package ID: B54VO8

Task Order: <u>1261.001D.05</u>

Aurora, CO 80014 SDG No.: <u>206348</u>, 206350 No. of Analyses: 26 Laboratory: Environmental Analytical Service Date: September 17, 2006 Reviewer: L. Calvin Reviewers Signature Analysis/Method: Volatiles by Method TO-15 SIM **ACTION ITEMS**<sup>a</sup> **Case Narrative Deficiencies** 2. **Out of Scope Analyses** 3. **Analyses Not Conducted** Missing Hardcopy **Deliverables** Incorrect Hardcopy Laboratory reported results to three decimal places rather than **Deliverables** three significant figures. **Deviations from Analysis** Qualifications were assigned for the following: Protocol, e.g., --exceeding analytical holding time Holding Times --method blank contamination GC/MS Tune/Inst. Performance --internal standard areas below method control limits Calibration -detects between the MDL and reporting limit estimated Method blanks -nondetects at MDL ammended to nondetects at reporting limit Surrogates Matrix Spike/Dup LCS Field QC Internal Standard Performance Compound Identification Quantitation System Performance COMMENTS<sup>b</sup> <sup>a</sup> Subcontracted analytical laboratory is not meeting contract and/or method requirements. b Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

MECX

12269 East Vassar Drive



# DATA VALIDATION REPORT

Vapor Migration Study

**ANALYSIS: VOLATILES** 

SAMPLE DELIVERY GROUPS: 206348, 206350

Prepared by

MEC<sup>x</sup>, LLC 12269 East Vassar Drive Aurora, CO 80014 DATA VALIDATION REPORT

#### 1. INTRODUCTION

Task Order Title: Vapor Migration Study

MEC<sup>X</sup> Project Number: 1261.001D.05 Sample Delivery Group: 206348, 206350 D. Hambrick Project Manager:

Air

Matrix:

Analysis: Volatiles QC Level: Level IV/V

No. of Samples: 26

No. of Reanalyses/Dilutions:

L. Calvin Reviewer:

Date of Review: September 17, 2006

The samples listed in Table 1 were validated based on the guidelines outlined in the MECX Data Validation Procedure for Volatile Organics (DVP-2, Rev. 0), EPA Method TO-15 (1/99), and the National Functional Guidelines for Organic Data Review (2/94). Any deviations from these procedures are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
BZVF01S01	MV575	206348-01	Air	TO-15 SIM
BZVF01E01	MV576	206348-02	Air	TO-15 SIM
CLVF01S01	MV577	206348-03	Air	TO-15 SIM
CLVF02S01	MV578	206348-04	Air	TO-15 SIM
CLVF03S01	MV579	206348-05	Air	TO-15 SIM
B1VF01S01	MV580	206348-06	Air	TO-15 SIM
B1VF02S01	MV581	206348-07	Air	TO-15 SIM
LXVF01S01	MV582	206348-08	Air	TO-15 SIM
LXVF01D01	MV583	206348-09	Air	TO-15 SIM
LXVF02S01	MV584	206348-10	Air	TO-15 SIM
BTVF01S01	MV585	206348-11	Air	TO-15 SIM
NCVF01S01	MV586	206348-12	Air	TO-15 SIM
FSVF01S01	MV587	206348-13	Air	TO-15 SIM
CFVF01S01	MV588	206348-14	Air	TO-15 SIM
CFVF02S01	MV589	206348-15	Air	TO-15 SIM
DAVF01S01	<b>M</b> ∨590	206348-16	Air	TO-15 SIM
DAVF02S01	MV591	206348-17	Air	TO-15 SIM
LXVF03S01	MV592	206350-01	Air	TO-15 SIM
LXVF04S01	MV593	206350-02	Air	TO-15 SIM
LXVF03S02	MV594	206350-03	Air	TO-15 SIM
LXVF05S01	MV595	206350-04	Air	TO-15 SIM
LXVF03S03	M∨596	206350-05	Air	TO-15 SIM
LXVF03D01	<b>M</b> ∨597	206350-06	Air	TO-15 SIM
LXVF06S01	MV598	206350-07	Air	TO-15 SIM
LXVF03E01	<b>M</b> ∨599	206350-08	Air	TO-15 SIM
LXVF03S04	M∨600	206350-09	Air	TO-15 SIM

Project: Soil Vapor SDG: 206348, 206350

Analysis: VOC

#### 2. DATA VALIDATION FINDINGS

#### 2.1 SAMPLE MANAGEMENT

According to the case narratives for these SDGs, the samples were received intact and in good condition, with acceptable canister pressures. The laboratory also provided canister QC certification records for the batches of canisters utilized. No problems were noted regarding sample handling and transport. No qualifications were required.

#### 2.1.2 Chain of Custody

The COCs were signed and dated by appropriate field and laboratory personnel, and accounted for the samples and analyses presented in these SDGs. No qualifications were required.

#### 2.1.3 Holding Times

The air samples were analyzed within 30 days of collection, with the exception of sample MV579. The sample required multiple analyses (see section 2.11) and the acceptable analysis reported by the laboratory was analyzed one day beyond the 30-day holding time. The result for sample MV579 was qualified as estimated, "J." No further qualifications were required.

#### 2.2 GC/MS TUNING

A BFB tune was not provided for one of the eight analytical sequences of these SDGs. The reviewer noted that the laboratory usually incorporated the BFB into the CCV or method blank analysis; therefore, the BFB analysis was not always performed at the beginning of the analytical sequence, as prescribed by the method. However, in all cases, the analysis of the BFB preceded the analysis of samples in an analytical sequence. All provided tunes met the method ion abundance criteria which were derived from USEPA SW-846 Method 8240B, and all samples were analyzed within 24 hours of the BFB injection times. No qualifications were assigned.

#### 2.3 CALIBRATION

Three initial calibrations (two SIM and one full-scan) were associated with the sample analyses of these SDGs, dated 08/02/06 and 08/09/06 (SIM), and 08/08/06 (full-scan). The %RSDs were within the method QC limit of  $\leq 30\%$  for all of the initial calibrations. Eight continuing calibrations were associated with the sample analyses, dated 08/03/06, 08/04/06, 08/06/06, 08/13/06, 08/14/06, 08/15/06 (two), and 08/17/06. The applicable target compound %Ds for all continuing calibrations were within the method QC limit of  $\leq 30\%$ .

Although the method does not specify minimum response factor criteria, the reviewer noted that average RRFs for the initial calibrations and RRFs for the continuing calibrations were ≥0.05 for all applicable target compounds. The %RSDs for the initial calibrations and %Ds for the continuing

Project: Soil Vapor SDG: 206348, 206350 Analysis: VOC

DATA VALIDATION REPORT

calibrations were verified from the raw data for several analytes and no errors were found. No qualifications were required.

#### 2.4 BLANKS

Eight method blanks (QC batches 080306-MS3, 080406-MS3, 080606-MS3, 081306-MS3, 081406-MS3, 081506-MS1, 081506-MS3, and 081706-MS1) were analyzed with these SDGs. The laboratory also supplied canister QC certification blanks for all canisters used in these SDGs. No target compounds were detected in the canister QC certification blanks.

Method blanks from QC batches 080306-MS3, 080606-MS3, and 081406-MS3 had target compound detects between the MDL and the reporting limit, and all had one or more associated samples with detects at concentrations less than five times the method blank concentrations. The reviewer recalculated rounded method blank and sample concentrations to more accurately determine contamination qualifications. Results for trichloroethene reported between the MDL and reporting limit in samples MV578, MV583, MV584, and MV591, tetrachloroethene in sample MV593, and both trichloroethene and tetrachloroethene in samples MV576 and MV599 were qualified as nondetects, "U," at the reporting limit.

Review of the method blank raw data indicated no false positives or false negatives. No further qualifications were required.

#### 2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

Eight LCS/LCSD pairs (QC batches 080306-MS3, 080406-MS3, 080606-MS3, 081306-MS3, 081406-MS3, 081506-MS1, 081506-MS3, and 081706-MS1) were analyzed with these SDGs. Tetrachloroethene was recovered above the laboratory QC limits of 70-130% in the LCSD only of LCS/LCSD pairs 080306-MS3 and 081406-MS3. All remaining recoveries were within the QC limits, and all RPDs were within the QC limit of ≤30%. No qualifications were required.

#### 2.6 SURROGATE RECOVERY

The surrogate recoveries were within the laboratory QC limits of 70-130% for all samples in these SDGs. A representative number of recoveries were calculated from the raw data, and no transcription or calculation errors were noted. No qualifications were required.

#### 2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Two sets of MS/MSD analyses were performed for the two SDGs, on site samples MV575 and MV592. Recoveries for 1,1-dichloroethene and trichloroethene were below the laboratory QC limits of 70-130% but ≥10% in the MSD only of MV575 MS/MSD, and the RPDs for both

Project: Soil Vapor SDG: 206348, 206350 Analysis: VOC

DATA VALIDATION REPORT

compounds exceeded the QC limit of ≤30%. All recoveries and RPDs were within the QC limits for MV592 MS/MSD. No qualifications were required.

#### 2.8 FIELD QC SAMPLES

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site samples. Following are findings associated with field QC samples:

#### 2.8.1 Trip Blanks

There was no trip blank sample associated with the site samples in these SDGs. No qualifications were required.

#### 2.8.2 Field Blanks and Equipment Rinsates

Samples MV576 and MV599 were identified as equipment blanks for the samples of SDGs 206348 and 206350, respectively. Trichloroethene and tetrachlorothene were both reported by the laboratory between the MDL and reporting limit in both equipment blanks; however, all equipment blank results were qualified as nondetects due to method blank contamination (see section 2.4). No site sample qualifications were required.

#### 2.8.3 Field Duplicates

Samples MV582/MV583 from SDG 206348 and samples MV592/MV597 from SDG 206350 were identified as field duplicates. Samples MV582 and MV583 had common detects for trichloroethene between the reporting limit and the MDL; however, the result in sample MV583 was qualified as a nondetect due to method blank contamination. Samples MV592 and MV597 had common detects above the reporting limit for trichloroethene. Tetrachloroethene was detected between the reporting limit and the MDL in sample MV592 and above the reporting limit in sample MV597, and cis-1,2-dichloroethene was detected only in sample MV597. The reviewer noted that sample MV592 was analyzed at a 50× dilution by SIM, and the field duplicate, MV597, was analyzed at approximately a 2× dilution by full-scan method. Although the resulting dilutions of the samples were roughly similar, the SIM and full-scan analyses were not comparable for duplicate purposes.

#### 2.9 INTERNAL STANDARDS PERFORMANCE

The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration; however, for validation purposes, the reviewer applied the more stringent Method TO-15 criteria of ±40% of the mean initial calibration internal standard area. All internal standard area recoveries were checked from the raw data.

#### DATA VALIDATION REPORT

Internal standard areas were below control limits but >25% of the applicable initial calibration mean area for samples MV576, MV583, MV584, MV587, MV588, MV591, MV592, MV594, and MV599. Results for the aforementioned samples were qualified as estimated, "UJ," for nondetects, and "J," for detects. The internal standard area for sample MV579 was above the control limit. The result for trichloroethene in MV579 was qualified as estimated, "J." No further qualifications were required.

#### 2.10 COMPOUND IDENTIFICATION

The laboratory analyzed for volatile target compound trichloroethene only in 16 samples, and for six volatile compounds in the remaining samples by modified EPA Method TO-15 SIM. Review of the sample chromatograms, retention times, and spectra indicated no problems with target compound identification. No qualifications were required.

#### 2.11 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification is verified at a Level IV data validation. No calculation or transcription errors were found. The reporting limits were supported by the low point of the initial calibration and the laboratory MDL study.

Samples MV579, MV592, MV594, MV595, MV596, MV597, MV598, and MV600 required lower volume analyses, or "dilution" due to either matrix interference or high concentrations of target compounds. In addition to dilution, samples MV579, MV595, MV596, and MV597 required reanalysis by full-scan method due to high concentrations of target compounds exceeding the calibration range of the SIM method. Only the acceptable dilutions and reanalyses were reported by the laboratory. MDLs and reporting limits were adjusted appropriately for dilution and/or full-scan analysis.

The laboratory reported all nondetects at the MDL; however, at the professional discretion of the reviewer, those results were changed on the sample result summaries to nondetects at the reporting limit (for  $\mu g/m^3$ ), rather than the MDL. Results were reported by the laboratory in both ppbv and units of  $\mu g/m^3$ , and in addition, a flux measurement was provided for each result. The reviewer noted that the laboratory reported results to three decimal places, rather than to three significant figures. No qualifications were required.

#### 2.12 TENTATIVELY IDENTIFIED COMPOUNDS

TICs were not reported by the laboratory for this SDG. No qualifications were required.

DATA VALIDATION REPORT

SDG: 206348, 206350 Analysis: VOC

#### 2.13 SYSTEM PERFORMANCE

Review of the raw data indicated no problems with system performance. No qualifications were required.



EPA Method TO-15 SIM GC/MS Analytical Method: TO-15 SIM					Laborat	SDG tory Number		
File: 0634801A.D Description: MV575 Can/Tube#: 789	-		Date I	Sampled: Received: extracted:			: 10:41	
Sam_Type: SA	7		Date /	Analyzed:	08/03/06	Time	: 14:34	
QC_Batch: 080306-MS3		Cai	n Dilutio	n Factor:	1.35		3	
Air Volume: 500 ml			Flu	x Factor:		0.038	5 0.0036	
	and the same						10001	
CAS# Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min	Total gray	Flag
79-01-6 Trichloroethene	0.002	0.002	0.012	0.149	.0.0120.	1490.0005	U \$	U
		Spike Amt.		Amount		QC	Flag	
Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
Toluene-d8		0.200		0.194	97	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

Jevel II

<sup>2)</sup> ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

<sup>4)</sup> U and ND are Flags used for Not Detected

<sup>5)</sup> J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



	od TO-15 SIM GC/MS						SDG:	206348
Analytical	Method: TO-15 SIM					Laborat	ory Number:	02
File: Descriptio Can/Tube				Date	Sampled: Received: Extracted:			10:39
Sam_Type					Analyzed:	08/14/06	Time:	19:09
-	: 081406-MS1		Ca	n Dilutio	n Factor:	1.39		3
Air Volum	e: 500 ml			Flu	ıx Factor:		0.0385	0.0036
	· · · · · · · · · · · · · · · · · · ·	MDL	Amount	MDL	ŔL	Amount	Flux	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)	1000
75-01-4	Vinyl chloride	0.005	0.005	0.014	0.073	0.0140.	0730.0005 ILT	エサリ
75-35-4	1,1-Dichloroethene	0.003	0.003	0.013	0.114	0.0130.	1140.0005	1110
156-60-5	trans-1,2-Dichloroethene	0.015	0.015	0.062	0.102		020.0024	Ū
156-59-2	cis-1,2-Dichloroethene	0.024	0.024	0.096	0.114		1140.0037	U
79-01-6	Trichloroethene	0.002	0.005	0.013	0.154	win.	540.0010	B
127-18-4	Tetrachloroethene	0.002	0.006	0.016	0.195		1950.0017	WVJ
	_		Spike Amt.		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.212	106	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

MC 09.20.04 Level II

<sup>2)</sup> ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

<sup>4)</sup> U and ND are Flags used for Not Detected

<sup>5)</sup> J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



EPA Meth Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM						Labora	SD0 tory Numbe		
File: Descriptio Can/Tube					Date I	Sampled: Received: Extracted:			<b>∍:</b> 12:46	3
QC_Batch	Sam_Type: SA QC_Batch: 080306-MS3			Car		Analyzed: on Factor:	08/03/06 1.39		e: 16:01 3	
Air Volum	e: 500 ml				Flu	ıx Factor:		0.038	5 0.0036	
CAS#	Compound		DL obv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min	grad great	Flag
79-01-6	Trichloroethene	. 0.	002	0.002	0.013	0.154	0.0130.	1540.0005	ルす	U
			,	Spike Amt.		Amount		QC	Flag	
	Surrogate Recovery			ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8			0.200		0.174	87	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

<sup>2)</sup> ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

<sup>4)</sup> U and ND are Flags used for Not Detected

<sup>5)</sup> J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



EPA Method TO-15 SIM GC/MS Analytical Method: TO-15 SIM						Labora	SDG tory Number		
File: Description: Can/Tube#:				Date	Sampled: Received: Extracted:			: 12:48	
Sam_Type: SA QC_Batch: 080306-MS3 Air Volume: 500 ml			Car	Date an Dilution	Analyzed: on Factor: ux Factor:	08/03/06 1.40	1,1110	3	
	Compound Trichloroethene	MDL ppbv 0.002	Amount ppbv 0.012	MDL ug/m3 0.013	RL ug/m3 0.155	Amount ug/m3 _0.0670.J	Flux V ug/(m2*min)	Na Dicola	Flag
	Surrogate Recovery		Spike Amt. ppbV 0.200		Amount ppbV	% Rec.	QC Limits 70-130	Flag * = Out	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

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20634804.MS3 Printed on 8/9/2006



			il .					
EPA Meth Analytical	nod TO-15 Full Scan GC/MS I Method: TO-15					Laborat	SDG: ory Number:	
File: Descriptio Can/Tube				Date	Sampled: Received: Extracted:			14:04
Sam_Type QC_Batch Air Volume	: 081706-MS1		Car	Date and Dilution	Analyzed: on Factor: ux Factor:	08/17/06 1.46		2
		MDL	Amount	MDL	RL	Amount	0.0385	
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	Flux ug/(m2*min)	Flag
79-01-6	Trichloroethene	0.21	22.32	1.14	9.00	123.45	4.753	TXHII
	Surrogate Recovery	S	pike Amt. ppbV		Amount ppbV	% Rec.	QC Limits	Flag * = Out
	Toluene-d8		10.000		10.550	105	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

PM 9/25/00

Environmental Analytical Service Page 1 of 1



	od TO-15 SIM GC/MS						SDG	i: 206348	
Analytical	l Method: TO-15 SIM					Laborat	ory Number	r: 06	
File:	0634806A.D	-		Date	Sampled:	07/17/06	Time	: 15:02	
Description	on: MV580			Date I	Received:	07/19/06			
Can/Tube	#: 642			Date E	Extracted:				
Sam_Type	e: SA			Date /	Analyzed:	08/04/06	Time	: 16:55	
QC_Batch: 080406-MS3		Can Dilution Factor:				1.47		3	
Air Volum	lume: 500 ml			Flu	ıx Factor:		0.038	5 0.0036	
		MDL	Amount	MDL	RL	Amount	Flux	Vial wall	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min	ALTO TALL THE	- 5
79-01-6	Trichloroethene	0.002	0.007	0.013	0.163	0.037	0.0014	T	J
			Spike Amt		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.183	91	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



	EPA Method TO-15 SIM GC/MS Analytical Method: TO-15 SIM					Laborat	SDG: tory Number:		
File: Description Can/Tube#				Date F	Sampled: Received: extracted:			15:05	
Sam_Type					Analyzed:			17:41	
QC_Batch:	QC_Batch: 080406-MS3		Cai	n Dilutio	n Factor:	1.40		3	
Air Volume	e: 500 ml			Flu	x Factor:		0.0385	0.0036	
CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	A WON	Flag
79-01-6	Trichloroethene	0.002	0.002	0.013	0.155	_0.0130.	550.0005	以 す	U
			Spike Amt.		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.201	100	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

<sup>2)</sup> ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

<sup>4)</sup> U and ND are Flags used for Not Detected

<sup>5)</sup> J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



	EPA Method TO-15 SIM GC/MS Analytical Method: TO-15 SIM					Laborat	SDG ory Number		
File: Descriptio Can/Tube#				Date F	Sampled: Received: extracted:			: 16:20	
Sam_Type: SA QC_Batch: 080406-MS3			Cai		Analyzed: n Factor:	08/04/06 1.52		: 18:25 3	
Air Volum	e: 500 ml			Flu	x Factor:		0.0385	0.0036	
CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	May Deade	Flag
79-01-6	Trichloroethene	0.002	0.003	0.014	0.168	0.018	0.0007	J	J
			Spike Amt.		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.183	92	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

<sup>2)</sup> ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

<sup>4)</sup> U and ND are Flags used for Not Detected

<sup>5)</sup> J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



_	nod TO-15 SIM							SDC	
Analytica	l Method:	TO-15 SIM					Labora	tory Numbe	r: 09
File: Description Can/Tube	0634809A. on: MV583 #: 321	D			Date	Sampled: Received: Extracted:			e: 16:26
Sam_Type: SA QC_Batch: 080306-MS3 Air Volume: 500 ml			Ca	Date . n Dilutio	Analyzed: on Factor:	08/03/06 1.42		3	
						ax i actor.		0.036	5 0.0036
CAS#	Compound		MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min	Tra grano Flag
79-01-6	Trichloroeth	nene	0.002	0.002	0.013	0.157	.0.0130.	1570.0005	UT BIT J
				Spike Amt.		Amount		QC	Flag
***************************************	Surrogate F	Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8			0.200		0.192	96	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Mc 09.20.04 Level II



EPA Metho Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG: cory Number:	206348 10
File: Description Can/Tube#				Date I	Sampled: Received: Extracted:			16:24
Sam_Type: SA					Analyzed:	08/03/06	Time:	0:12
QC_Batch: 080306-MS3			Can Dilution Factor:			1.38		3
Air Volume: 500 ml				Flu	x Factor:		0.0385	0.0036
		MDL	Amount	MDL	RL	Amount	Flux ₹	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)	2000
79-01-6	Trichloroethene	0.002	0.003	0.012	0.153	0.0150.1	1530.0006 U	T BI# J
			Spike Amt	•	Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.154	77	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level II



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG: tory Number:	206348 11	
File: Descriptio Can/Tube#				Date I	Sampled: Received: Extracted:			8:20	
Sam_Type: SA QC_Batch: 080406-MS3 Air Volume: 500 ml			Car	n Dilutio	Analyzed: on Factor: ix Factor:	08/04/06 1.40		19:21 3 0.0036	
CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	) Ocod	Flag
79-01-6	Trichloroethene	0.002	0.007	0.013	0.155	0.036	0.0014	J	J
			Spike Amt.	•	Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.164	82	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

LevelI



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG ory Number		
File: Descriptio Can/Tube#				Date I	Sampled: Received: Extracted:			9:15	
Sam_Type: SA				Date /	Analyzed:	08/04/06	Time	20:06	
QC_Batch: 080406-MS3			Can Dilution Factor:					3	
Air Volum	e: 500 ml			Flu	ıx Factor:		0.038	5 0.0036	
		MDL	Amount	MDL	RL	Amount	Flux	VINAVIGE	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min	AC TO	
79-01-6	Trichloroethene	0.003	0.005	0.015	0.179	0.026	0.0010	1	J
			Spike Amt		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.181	91	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

Level II

<sup>2)</sup> ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

<sup>4)</sup> U and ND are Flags used for Not Detected

<sup>5)</sup> J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



	nod TO-15 SIN I Method:	M GC/MS TO-15 SIM					Laborat	SDG: tory Number	
File: Description Can/Tube	0634813A. on: MV587 #: 370	.D			Date I	Sampled: Received: Extracted:			10:12
Sam_Type: SA QC_Batch: 080406-MS3 Air Volume: 500 ml			Ca	n Dilutio	Analyzed: on Factor: ix Factor:	08/04/06 1.44		20:50 3 0.0036	
CAS# 79-01-6	Compound Trichloroetl		MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	wal grade Flag
73-01-0			0.002	0.114 Spike Amt.	0.013	0.159 Amount	0.632	0.0243 QC	Flag
	Surrogate F Toluene-d8		The Arterial School	ppbV 0.200		ppbV 0.193	% Rec. 96	Limits 70-130	* = Out

Notes: 1) Reported results are to be interpreted to two significant figures.

<sup>2)</sup> ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

<sup>4)</sup> U and ND are Flags used for Not Detected

<sup>5)</sup> J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



EPA Metho Analytical I	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG: ory Number:	206348 14
File: Description Can/Tube#				Date F	Sampled: Received: extracted:			11:04
Sam_Type: QC Batch:	: SA 080406-MS3		Ca		Analyzed: n Factor:	08/04/06 1.43		21:30 3
Air Volume				Flu	x Factor:		0.0385	0.0036
CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux vug/(m2*min)	out of Flag
79-01-6	Trichloroethene	0.002	0.082	0.013	0.158	0.455	0.0175	TI
			Spike Amt	•	Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.181	91	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Leve II



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG: ory Number:	206348 15
File: Descriptio Can/Tube#				Date F	Sampled: Received: Extracted:			11:06
Sam_Type	: SA			Date /	Analyzed:	08/04/06	Time:	22:15
QC_Batch	: 080406-MS3		Car	n Dilutio	n Factor:	1.48		3
Air Volum	e: 500 ml			Flu	x Factor:		0.0385	0.0036
CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux vug/(m2*min)	yal gual Flag
79-01-6	Trichloroethene	0.002	0.060	0.013	0.164	0.329	0.0127	
			Spike Amt.		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.152	76	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

<sup>2)</sup> ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

<sup>4)</sup> U and ND are Flags used for Not Detected

<sup>5)</sup> J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG: ory Number:		
File: Descriptio Can/Tube#				Date I	Sampled: Received: extracted:			12:04	
Sam_Type QC_Batch:	: SA : 080606-MS3		Ca		Analyzed: on Factor:	08/06/06 1.37	Time:	13:32 3	
Air Volume	e: 500 ml			Flu	x Factor:		0.0385	0.0036	
CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	A London	Flag
79-01-6	Trichloroethene	0.002	0.027	0.012	0.152	0.150	0.0058	T	J
			Spike Amt.		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.174	87	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

LEVEL N



EPA Metho Analytical I	d TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG: tory Number:	
File: Description Can/Tube#:		-		Date F	Sampled: Received: extracted:			12:06
Sam_Type:					Analyzed:			
QC_Batch:	080606-MS3		Ca	n Dilutio	n Factor:	1.39		3
Air Volume	: 500 ml			Flu	x Factor:		0.0385	0.0036
		MDL	Amount	MDL	RL	Amount	Flux .*	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*min)	10 10e
79-01-6	Trichloroethene	0.002	0.016	0.013	0.154	0.9870.	154 0.0033 V	U BI\$ J
			Spike Amt.		Amount		QC	Flag
	Surrogate Recovery	ĺ	ppbV		ppbV	% Rec.	Limits	* = Out
	Toluene-d8		0.200		0.189	95	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

4) U and ND are Flags used for Not Detected

5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

DC 09.20.04



EPA Metho Analytical	od TO-15 SIM GC/MS Method: TO-15 SIM					Labora	SDG: tory Number:	206350 01	
File: Description Can/Tube#	: 673			Date	Sampled: Received: Extracted:			8:02	
Sam_Type: QC_Batch: Air Volume	081506-MS3		Са	n Dilutio	Analyzed: on Factor: ux Factor:	08/15/06 1.36		16:36 3 0.0036	
CAS# 75-01-4 75-35-4 156-60-5 156-59-2 79-01-6 127-18-4	Compound Vinyl chloride 1,1-Dichloroethene trans-1,2-Dichloroethene cis-1,2-Dichloroethene Trichloroethene Tetrachloroethene	MDI ppbv 0.25 0.15 0.73 1.15 0.11	y ppby 7 0.257 3 0.158 3 0.738 1 1.151 1 40.632	MDL ug/m3 0.677 0.646 3.022 4.712 0.615 0.769	RL ug/m3 3.590 5.565 5.011 5.565 7.524 9.534	0.6465 3.0225	Flux ug/(m2*min) 570.0261 570.0249 010.1163 570.1814 8.6541 0.0325		Flag U U U U U
	Surrogate Recovery Toluene-d8		Spike Amt. ppbV 0.200		Amount ppbV 0.258	% Rec. 129	QC Limits 70-130	Flag * = Out	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level II/I



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG ory Number		
File: Descriptio Can/Tube#				Date I	Sampled: Received: extracted:			9:03	
Sam_Type QC_Batch: Air Volume	: 081406-MS1		Car	n Dilutio	Analyzed: on Factor: ox Factor:	08/14/06 1.38		3	
CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux \ug/(m2*min)	(el)	Flag
75-01-4 75-35-4 156-60-5 156-59-2 79-01-6 127-18-4	Vinyl chloride 1,1-Dichloroethene trans-1,2-Dichloroethene cis-1,2-Dichloroethene Trichloroethene Tetrachloroethene	0.005 0.003 0.015 0.023 0.002 0.002	0.005 0.006 0.015 0.023 0.030 0.007	0.014 0.013 0.061 0.096 0.012 0.016	0.073 0.113 0.102 0.113 0.153 0.193	0.024 0.061 0.096 0.168	0.0009	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	U U U
	Surrogate Recovery Toluene-d8	\$	Spike Amt. ppbV 0.200		Amount ppbV 0.180	% Rec.	QC Limits 70-130	Flag * = Out	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level II/II



EPA Method TO-15 SIM GC/MS SDG: 206350 **Analytical Method: TO-15 SIM Laboratory Number:** 03 File: 0635003A.D Date Sampled: 07/19/06 Time: 10:02 Description: MV594 Date Received: 07/20/06 Can/Tube#: 532 Date Extracted: Sam\_Type: SA Date Analyzed: 08/15/06 Time: 17:14 Can Dilution Factor: QC\_Batch: 081506-MS3 1.36 Air Volume: Flux Factor: 0.0385 0.0036 10 ml

		MDL	Amount	MDL	RL	Amount	Flux	A TOTAL OF	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*mi	n)80 9000	
75-01-4	Vinyl chloride	0.257	0.257	0.677	3.590	0.6773.	5900.0261	M Is	U
75-35-4	1,1-Dichloroethene	0.158	0.158	0.646	5.565	0.6465.	5650.0249	1 1 1	U
156-60-5	trans-1,2-Dichloroethene	0.738	1.087	3.022	5.011	4.450	0.1713	d	J
156-59-2	cis-1,2-Dichloroethene	1.151	1.930	4.712	5.565	7.899	0.3041		
79-01-6	Trichloroethene	0.111	96.884	0.615	7.524	535.974	20.6350		
127-18-4	Tetrachloroethene	0.110	0.355	0.769	9.534	2.486	0.0957	1 1	J
			Spike Amt		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.206	103	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

AC 09.20.06
Lievel II/I

# ENVIRONMENTAL Analytical Service, Inc.

EPA Methor Analytical	od TO-15 Full Scan GC/MS Method: TO-15					Laborat	SD ory Numbe		-
File: Descriptio Can/Tube#				Date I	Sampled: Received: Extracted:			e: 10:52	2
Sam_Type QC_Batch Air Volume	: 081706-MS1		Саі	n Dilutio	Analyzed: on Factor: ix Factor:	08/17/06 2.56		,,,,,,	İ
CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*mir	And grow	Flag
75-01-4 75-35-4	Vinyl chloride 1,1-Dichloroethene	12.0 19.5	12.0 19.5	31.8 79.6	344.6 544.7	31.834	4.6 1.22 4.7 3.06	U. \$	U
156-60-5 156-59-2 79-01-6	trans-1,2-Dichloroethene cis-1,2-Dichloroethene	79.6 13.6	7 <sup>9</sup> .6 35.1	325.9 55.5	461.1 539.5	143.6	5.53	7 1	U J
127-18-4	Trichloroethene Tetrachloroethene	16.6 10.5	822.7 10.5	92.1 73.6	729.4 924.2	4,551.0 73.692	175.21 <b>4.2</b> 2.83	4	U
	Surrogate Recovery		Spike Amt. ppbV		Amount	0/ Boo	QC	Flag	
	Toluene-d8		10.000		ppbV 9.904	% Rec. 99	Limits 70-130	* = Out	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

20635004.MS1 Printed on 8/18/2006 Level II / I
Environmental Analytical Service
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EPA Metho	od TO-15 Full Scan GC/MS Method: TO-15					Laborato	SDory Numbe		
File: Descriptio	0635005B.D				Sampled: Received:		Tim	e: 12:1	9
Can/Tube#					xtracted:	01120100			
Sam_Type	: SA					08/17/06	Tim	e: 14:4	5
QC_Batch	: 081706-MS1		Ca	n Dilutio	n Factor:	1.81			1
Air Volume	e: 10 ml		1	Flu	x Factor:		0.038	85 (0.0036	3
			- 1					cell a)	
		MDL	Amount	MDL	RL	Amount	Flux	ave ave	Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*mi	n)()   (())	
75-01 <b>-</b> 4	Vinyl chloride	8.5	8.5	22.5	243.6	22.5	<b>5.</b> ∳ 0.87	4 \$	U
75-35-4	1,1-Dichloroethene	13.8	13.8	56.3	385,1	56.33%	5.12.17		U
156-60-5	trans-1,2-Dichloroethene	56,3	56.3	230.4	326.0	230:432	le.0 8.87	$\sqrt{ V }$	Ų
156-59-2	cis-1,2-Dichloroethene	9.6	9.8	39.3	381.4	40.2	1.55	J	J
79-01-6	Trichloroethene	11.8	249.5	65.1	515.7	1,380.4	53.15		
127-18-4	Tetrachloroethene	7.4	9.5	52.0	653.4	66.3	2.55	J	J
								- Company	
		,	Spike Amt		Amount		QC	Flag	
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		10.000		9.997	100	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

UNC 09.20.06 Lieve II/I

<sup>2)</sup> ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

<sup>4)</sup> U and ND are Flags used for Not Detected

<sup>5)</sup> J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

# ENVIRONMENTAL Analytical Service, Inc.

EPA Metho Analytical I	d TO-15 Full Scan GC/MS Method: TO-15					Laborator	SDG: y Number:		
File: Description	0635006A.D a: MV597				Sampled: Received:		Time:	12:43	
Can/Tube#: Sam_Type:	SA			Date E	xtracted: Analyzed:		Time:	14:44	
Air Volume:	081506-MS1 216 ml		Cai		n Factor: ıx Factor:	1.41	0.0385	0.0036	
CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3 u	Flux g/(m2*min)	A113 'UNZ AIT	Flag
75-01-4 75-35-4	Vinyl chloride 1,1-Dichloroethene	0.31 0.50	0.31 0.50	0.81 2.03	8.79 13.89	2.0313.8	0.031	4 7	U
156-60-5 156-59-2	trans-1,2-Dichloroethene cis-1,2-Dichloroethene	2.03 0.35	2.03 2.27	8.31	11.76	8.3411.7	0.320	1	U
79-01-6	Trichloroethene	0.42	131.22	1.42 2.35	13.76 18.60	9.31 725.91	0.358 T		J
127-18-4	Tetrachloroethene	0.27	0.51	1.88	47.13	3.54	0.136	J	J
	Surromata Danasa	Ş	Spike Amt.		Amount		QC	Flag	

Notes: 1) Reported results are to be interpreted to two significant figures.

Surrogate Recovery

Toluene-d8

ppbV

10.000

ppbV

9.822

% Rec.

98

Limits

70-130

\* = Out

HC 09.70.0p

<sup>2)</sup> ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

<sup>4)</sup> U and ND are Flags used for Not Detected

<sup>5)</sup> J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)



EPA Metho Analytical I	d TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG ory Numbe		•
File:	0635007A.D				Sampled:	07/19/06		e: 13:26	3
Description Can/Tube#					Received:	07/20/06			
Sam_Type:					Analyzed:	08/15/06	Time	e: 15:56	3
	081506-MS3		Cai		n Factor:	1.40		3	3
Air Volume	e: 200 ml			Flu	x Factor:		0.038	5 0.0036	3
	0	MDL	Amount	MDL	RL	Amount	Flux		Flag
CAS#	Compound	ppbv	ppbv	ug/m3	ug/m3	ug/m3	ug/(m2*mir	17	
75-01-4	Vinyl chloride	0.013	0.013	0.035	0.185		<b>15</b> 50.0013	4 1 年	U
75-35-4	1,1-Dichloroethene	0.008	0.008	0.033	0.286	0.0330.	<b>236</b> 0.0013	4 4	U
156-60-5	trans-1,2-Dichloroethene	0.038	0.146	0.156	0.258	0.599	0.0231		
156-59-2	cis-1,2-Dichloroethene	0.059	0.075	0.243	0.286	0.306	0.0118		
79-01-6	Trichloroethene	0.006	4.543	0.032	0.387	25.134	0.9677		
127-18-4	Tetrachloroethene	0.006	0.017	0.040	0.491	0.122	0.0047	J	J
			Spike Amt	•	Amount		QC	Flag	
	Surrogate Recovery	ĺ	ppbV		ppbV	% Rec.	Limits	* = Out	
	Toluene-d8		0.200		0.192	96	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 0920.04 Level IV/U



EPA Metho	od TO-15 SIM GC/MS Method: TO-15 SIM					Laborato	SDG: ory Number:		
File: Description Can/Tube#				Date I	Sampled: Received: Extracted:		Time:	14:10	
_	: 081406-MS1		Ca	n Dilutio	n Factor:	08/14/06 1.40	Time:	9:43 3	
Air Volume	e: 500 ml			Flu	ıx Factor:		0.0385	0.0036	
CAS# 75-01-4	Compound Vinyl chloride	MDL ppbv 0.005	Amount ppbv 0.005	MDL ug/m3 0.014	RL ug/m3 0.074	0.0140.0		11/1/3 2/2	√Flag U
75-35-4 156-60-5 156-59-2 79-01-6	1,1-Dichloroethene trans-1,2-Dichloroethene cis-1,2-Dichloroethene Trichloroethene	0.003 0.015 0.024 0.002	0.003 0.015 0.024	0.013 0.062 0.097	0.115 0.103 0.115	0.0620.10 0.0970.1	50.0005 30.0024 50.0037		U U
127-18-4	Tetrachloroethene	0.002	0.013 0.003	0.013 0.016	0.155 0.196		50.0028 y 760.0008	1 111	J 
	Surrogate Recovery		Spike Amt. ppbV	•	Amount ppbV	% Rec.	QC Limits	Flag * = Out	
	Toluene-d8		0.200		0.198	99	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.20.06 Level IV/I



EPA Metho	d TO-15 SIM GC/MS Method: TO-15 SIM					Laborat	SDG ory Number		
File: Description				Date F	Sampled: Received:			: 15:33	
Can/Tube#: Sam_Type: QC_Batch: Air Volume	SA 081306-MS3		Cai	Date A	n Factor:	08/13/06 1.37		3	
All volume	. 10 IIII			Fiu	x Factor:		0.0385	0.0036	
CAS# 75-01-4 75-35-4	Compound Vinyl chloride 1,1-Dichloroethene	MDL ppbv 0.258 0.159	Amount ppbv 0.258 0.159	MDL ug/m3 0.682 0.651	RL ug/m3 3.616 5.606		Flux ug/(m2*min \$ \$0.0263 \$ \$0\$0.0251	Hal good	Flag U U
156-60-5 156-59-2 79-01-6	trans-1,2-Dichloroethene cis-1,2-Dichloroethene Trichloroethene	0.744 1.160 0.112	0.835 1.722 74.412	3.044 4.746 0.619	5.048 5.606 7.579	3.420 7.048 411.653	*	7	J
127-18-4	Tetrachloroethene	0.111	0.274	0.775	9.604	1.922	0.0740	J	J
	0		Spike Amt.		Amount	0/ 5	QC	Flag	
	Surrogate Recovery Toluene-d8		ppbV 0.200		ppbV 0.202	% Rec.	Limits 70-130	* = Out	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.20.06 Level II/I

## Appendix D

(Electronic)

D-2: Data Validation Report, October/November Sampling Activities



12269 East Vassar Drive, Aurora, CO 80014 720.535.5502, Fax 720.535.7555

#### DATA ASSESSMENT FORM

Project Title: Vapor Migration Study

Project Manager: D. Hambrick

Analysis/Method: EPA Method TO-15

QC Level: IV/V1

SDG: 206536

Matrix: Air

No. of Samples: 16

No. of Reanalyses/Dilutions: 6

Date Reviewed: December 11, 2006

Reviewer: L. Calvin

Reference: MECX Data Validation Procedure for Volatile Organics (DVP-2,

Rev. 0), EPA Method TO-15 (1/99), and USEPA Contract Laboratory Program National Functional Guidelines for Organic

Data Review (2/94)

Samples Reviewed: MV655, MV656, MV657, MV658, MV659, MV660, MV661,

MV662, MV663, MV664, MV665, MV666, MV667, MV668,

MV669, MV670

#### **Data Validation Findings**

	Findings	Qualifications
Sample     Management	According to the case narrative for this SDG, the samples were received intact and in good condition, with acceptable canister pressures. The laboratory also provided canister QC certification records for the batches of canisters utilized. The COCs were signed and dated by appropriate field and laboratory personnel, and accounted for the samples and analyses presented in this SDG.  The full-scan analysis of sample MV661, the SIM analysis of sample MV663, and both the SIM and full-scan analyses of sample MV664 were performed beyond the 30-day holding time. The remaining air samples were analyzed within 30 days of collection.	Retained esults for samples MV661 (full-scan only), MV663 and MV664 were qualified as estimated, "UJ" for nondetects and "J" for detects.

Project: Soil Vapor SDG: 206536 Analysis: VOC

		Findings	Qualifications
3.	Calibration	The initial calibration %RSDs and the continuing calibration %Ds were within the method QC limit of ≤30% for all applicable target compounds.	No qualifications were required.
4.	Method Blanks 111606-MS3 111706-MS3 112706-MS1 112706-MS1 112906-MS1 113006-MS1 120106-MS1 120106-MS3	Eight method blanks were analyzed with the samples in this SDG. Method blanks 112706-MS3, 113006-MS1, and 120106-MS3 were associated with the full-scan analyses, and had no reported target compound detects. The remaining blanks all had one or more target compound detects between the MDL and the reporting limit as follows: trichloroethene (0.78 μg/m³) in 111606-MS3; trichloroethene (681.2 μg/m³) in 111706-MS3; 1,1-dichloroethene (15.69 μg/m³) and trichloroethene (33.92 μg/m³) in 112706-MS1; 1,1-dichloroethene (52.05 μg/m³) and trichloroethene (60.85 μg/m³) in 112906-MS1; and 1,1-dichloroethene (601 μg/m³), and tetrachloroethene (1150 μg/m³), and tetrachloroethene (1795 μg/m³) in 120106-MS1. Trichloroethene (18787 μg/m³) was also detected in 120106-MS1 above the reporting limit.  Samples MV665, MV668, and MV670 had detects between the MDLs and reporting limits for 1,1-dichloroethene. All remaining sample detects exceeded five times the applicable method blank concentrations.  The laboratory also supplied canister QC certification blanks for all canisters used in this SDG. No target compounds were detected in the canister QC certification blanks.	Results for 1,1-dichloroethene in samples MV665, MV668, and MV670 were qualified as nondetects, "U," at the reporting limit.
5.	LCS/LCSD 111606-MS3 111706-MS3 112706-MS1 112706-MS3 112906-MS1 113006-MS1 120106-MS1 120106-MS3	Eight LCS/LCSD pairs were analyzed with the samples in this SDG. In the LCSD only of 120106-MS3, vinyl chloride was recovered below the QC limits but ≥10%. All remaining LCS/LCSD recoveries were within the laboratory QC limits of 70-130%, and all RPDs were within the QC limit of ≤30%.	No qualifications were required.
6.	Surrogates	The surrogate toluene-d8 was recovered above the QC limits of 70-130% in samples MV663 and MV655. The surrogate was recovered within the laboratory QC limits of 70-130% for all remaining samples.	Detects in samples MV663 and MV665 were qualified as estimated, "J."

Project: Soil Vapor SDG: 206536 Analysis: VOC

	Findings	Qualifications
7. MS/MSD MV661	Native concentrations of cis-1,2-dichloroethene and trichloroethene in the parent sample exceeded four times the spike amount, and recoveries for those compounds were not evaluated. Recoveries for the remaining compounds were within the laboratory QC limits of 70-130%, and the RPDs were within the QC limit of ≤30%.	No qualifications were required.
8. Field QC FB: MV670 ER: None FD: MV662/MV669	The field blank had a detect above the reporting limit for trichloroethene at a concentration of 1580.49µg/m3. Associated site samples MV655, MV656, MV657, MV658, and MV659 had trichloroethene detected at concentrations less than five times the field blank amount.  The field duplicate samples had common detects above the reporting limit for trans-1,2-dichloroethene, cis-1,2-dichloroethene, and trichloroethene; with RPDs of 10%, 12%, and 2.5%, respectively. Tetrachloroethene was detected below the reporting limits in both samples. The pair was considered to be in good agreement.	Results for trichloroethene in samples MV655, MV656, MV657, MV658, and MV659 were qualified as estimated, "J."
10. Other	The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration to evaluate samples; however, for validation purposes, the reviewer applied the more stringent Method TO-15 criteria of ±40% of the mean initial calibration internal standard area. For the SIM analysis, the internal standard a,a,a-trifluorotoluene was below the control limits for sample MV663, and for the full-scan analysis of sample MV666, both internal standards pentafluorobenzene and 1,4-difluorobenzene were above the control limits.	All results were qualified as estimated, "J," for detects and "UJ," for nondetects in sample MV663, and all reported detects were qualified as estimated, "J," in the full-scan analysis of sample MV666.
	All samples were analyzed and reported by the SIM method; however, samples MV660, MV661, MV662, MV664, MV666, and MV669 required additional analysis by full-scan method due to high concentrations of target compounds exceeding the calibration range of the SIM method, and the full-scan analyses were performed at lower volumes, or "dilutions." All samples analyzed by SIM (with the exception of sample MV658) also required significant diluations for target compounds. Only the acceptable dilutions and reanalyses were reported by the laboratory. MDLs and	methods, results exceeding the linear range of the calibration in the SIM analyses were rejected "R," in favor of the full-scan results, and all remaining full-scan results were rejected in favor of acceptable SIM results

Project: Soil Vapor SDG: 206536 Analysis: VOC

	Findings	Qualifications
10. Other (continued)	reporting limits were adjusted appropriately for dilution and/or full-scan analysis.	
	The laboratory reported results between the MDL and the reporting limit. The laboratory reported any nondetects at the MDL; however, at the professional discretion of the reviewer, those results were changed on the sample result summaries to nondetects at the reporting limit (for µg/m³), rather than the MDL.  The case narrative for this SDG noted that the laboratory raised the MDLs in sample MV663 due to matrix interference (note that both the surrogate recovery and internal standard area were affected.)  Results were reported by the laboratory in both ppbv and units of µg/m³. The reviewer noted	Detects reported between the MDL and the reporting limit were qualified as estimated, "J."
	that the laboratory reported results to two decimal places, rather than to three significant figures.	
Comments	None.	None.

Level IV/V validation consists of review of the summary forms and minimal review of the raw data as necessary. The reported values on the summary forms are presumed to be correct and no verification of the values from the raw instrument output is performed.

# ENVIRONMENTAL Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS

Analytical Method:

**TO-15 SIM** 

SDG:

70-130

206536

Laboratory Number:

15

File:

0653615A.D

Toluene-d8

Description: MV655 Can/Tube#: 764

Sam\_Type: SA QC\_Batch: 112706-MS1

Air Volume:

2037265

6-MS1 2 ml Date Sampled: 11/01/06 11:58

Date Received: 11/03/06 10:00 Date Extracted: 11/27/06 15:35 Date Analyzed: 11/27/06 15:35

Can Dilution Factor:
Not Detected Flag:

0.313

1.54

1.04

156

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
79016	Trichloroethene	0.62	40.04	690.95	3.41	221.51	3,822.39	J
	Surrogate Recovery		Spike Am	t.	Amount ppbV	% Rec.	QC Limits	Flag * = Out

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

0.200

MC12.04 Level II /

# VIRONMENTAL Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS

**TO-15 SIM** 

SDG:

206536

Analytical Method:

Can/Tube#: 642

Sam\_Type: SA

Air Volume:

2037265

QC\_Batch: 112706-MS1

Laboratory Number:

16

File:

0653616A.D

Toluene-d8

Description: MV656

Date Sampled: 11/01/06 13:50 Date Received: 11/03/06 10:00

Date Extracted: 11/27/06 16:53

Date Analyzed: 11/27/06 16:53

0.181

90

Can Dilution Factor:

Not Detected Flag:

70-130

CAS#	Compound	MDL ppbv	RL ppbv	Amount	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag	10
79016	Trichloroethene	0.58	37.96	338.42	3.23	210.00	1,872.20	J	F
	Surrogate Recovery		Spike Ami	t.	Amount ppbV	% Rec.	QC Limits	Flag * = Ou	t

0.200

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20653616.MS1 Printed on 12/4/2006

Environmental Analytical Service

Page 1 of 1

# NVIRONMENTAL Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS

Analytical Method:

**TO-15 SIM** 

SDG:

206536

**Laboratory Number:** 

14

File:

0653614A.D

Description: MV657 Can/Tube#: 534

Sam\_Type: SA

Air Volume:

QC\_Batch: 112706-MS1 2 ml Date Sampled: 11/01/06 9:59

Date Received: 11/03/06 10:00 Date Extracted: 11/27/06 14:47 Date Analyzed: 11/27/06 14:47

Can Dilution Factor:

Not Detected Flag:

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
79016	Trichloroethene	0.57	36.92	584.77	3.14	204.24	3,234.98	1
	Surrogate Recovery		Spike Amt		Amount ppbV	% Rec.	QC Limits	Flag * = Out
2037265	Toluene-d8		0.200		0.175	88	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Environmental Analytical Service Page 1 of 1

Report File Name: 20653614.MS1 Printed on 12/4/2006

## LNVIRONMENTAL Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS

Analytical Method:

**TO-15 SIM** 

SDG:

206536

20 ml

**Laboratory Number:** 

01

File:

0653601A.D

Description: MV658

Can/Tube#: 537 Sam Type: SA

Air Volume:

QC\_Batch: 111606-MS3

Date Sampled: 10/30/06 11:38 Date Received: 11/03/06 10:00

Date Extracted: 11/16/06 14:47 Date Analyzed: 11/16/06 14:47

Can Dilution Factor:

Not Detected Flag:

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75014	Vinyl chloride	0.14	0.73	0.14	0.36	1.91	1.91 0.36	UW
75354	1,1-Dichloroethene	0.09	0.73	0.09	0.36	2.97	2.97 0.36	U
156605	trans-1,2-Dichloroethene	0.39	3.12	0.39	1.60	12.76	12.741.60	U
156592	cis-1,2-Dichloroethene	0.62	3.77	0.62	2.52	15.43	15.432.52	U
79016	Trichloroethene	0.06	3.77	63.14	0.32	20.86	349.28	3
127184	Tetrachloroethene	0.58	3.70	1.50	4.07	25.92	10.48	13
			Spike Amt.		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8		0.200		0.173	87	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Environmental Analytical Service Page 1 of 1

Report File Name: 20653601.MS3 Printed on 12/4/2006

VIRONMENTAL Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS

SDG:

206536

**Analytical Method:** 

**TO-15 SIM** 

Laboratory Number:

02

File:

0653602A.D

Date Sampled: 10/30/06 13:03

Description: MV659 Can/Tube#: 792

Date Received: 11/03/06 10:00 Date Extracted: 11/16/06 15:30

Sam\_Type: SA

Date Analyzed: 11/16/06 15:30 Can Dilution Factor:

QC\_Batch: 111606-MS3 Air Volume:

2 ml

Not Detected Flag:

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75014	Vinyl chloride	1.40	7.35	1.40	3.69	19.40	19.403.69	UU
75354	1,1-Dichloroethene	0.88	7.35	0.88	3.61	30.08	30.083.61	U
156605	trans-1,2-Dichloroethene	3.97	31.61	3.97	16.25	129.38	129.3416.25	U
156592	cis-1,2-Dichloroethene	6.25	38.22	6.25	25.57	156.40	156.425.57	U 🎶
79016	Trichloroethene	0.59	38.22	829.12	3.25	211.44	4,586.75	J
127184	Tetrachloroethene	5.88	37.49	11.66	41.22	262.77	81.71	1 1
			Spike Amt		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8		0.200		0.188	94	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20653602.MS3 Printed on 11/29/2006

**Environmental Analytical Service** 

Page 1 of 1

Analytical Service, Inc.

**EPA Method TO-15 SIM GC/MS** 

**Analytical Method:** 

**TO-15 SIM** 

SDG:

206536

**Laboratory Number:** 

03

File:

0653603A.D

Description: MV660

Can/Tube#: 784

Sam\_Type: SA

QC\_Batch: 111606-MS3 Air Volume:

0.1 ml

Date Sampled: 10/30/06 15:22

Date Received: 11/03/06 10:00 Date Extracted: 11/16/06 16:21

Date Analyzed: 11/16/06 16:21 Can Dilution Factor: Not Detected Flag:

1.31

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75014	Vinyl chloride	24.9	131.0	24.9	65.7	345.8	5.8 65.7	ULL
75354	1,1-Dichloroethene	15.7	131.0	15.7	64.3	536.1 5	56.1 84.3	U
156605	trans-1,2-Dichloroethene	70.7	563.3	5,205.1	289.6	2,306.0	21,308.3	
156592	cis-1,2-Dichloroethene	111.4	681.2	10,783.8	455.7	2,787.5	44,127.9	
79016	Trichloroethene	10.5	681.2	136,204.8	58.0	3,768.5	753,498.1	EK
127184	Tetrachloroethene	104.8	668.1	104.8	734.7	4,683.5 4	PS:5234.7	UUL
			Spike Am	t.	Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8		0.200		0.178	89	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

12.12.04

**Environmental Analytical Service** 

Page 1 of 1

Report File Name: 20653603.MS3 Printed on 11/29/2006

# NVIRONMENTAL. Analytical Service, Inc.

EPA Method TO-15 Full Scan GC/MS

Analytical Method:

TO-15

SDG:

206536

Date Sampled: 10/30/06 15:22

**Laboratory Number:** 

03

File:

0653603B.D

Compound

Vinyl chloride

Description: MV660

Can/Tube#: 784

Sam\_Type: SA QC\_Batch: 112706-MS3

Air Volume:

CAS#

75014

0.1 ml

Date Received: 11/03/06 10:00

RL

ug/m3

17,634

Date Extracted: 11/27/06 17:37

MDL

ug/m3

2,929

Date Analyzed: 11/27/06 17:37

Can Dilution Factor: Not Detected Flag:

Amount

ppbv

1,110

1.31

U

Amount ug/m3 2,929

	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
			Spike Ami	t.	Amount	9/ Dec	QC	Flag
127184	Tetrachloroethene	504	6,747	504	3,531	47,294	3,531	UR
79016	Trichloroethene	287	6,747	268,189	1,586	37,322	1,483,648	
156592	cis-1,2-Dichloroethene	358	6,747	22,221	1,466	27,607	90,929	V
156605	trans-1,2-Dichloroethene	682	5,764	13,977	2,794	23,596	57,218	
75354	1,1-Dichloroethene	776	6,812	776	3,177	27,875	3,177	U

RL

ppbv

6,681

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

MDL

ppbv

1,110

- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Environmental Analytical Service Page 1 of 1

Report File Name: 20653603.FS3 Printed on 12/4/2006

# Analytical Service, Inc.

**EPA Method TO-15 SIM GC/MS** 

Analytical Method:

**TO-15 SIM** 

SDG:

206536

Laboratory Number:

04

File:

0653604A.D

Description: MV661

Report File Name: 20653604.MS3

Printed on 11/29/2006

Can/Tube#: 626 Sam\_Type: SA

QC\_Batch: 111606-MS3 Air Volume:

0.1 ml

Date Sampled: 10/30/06 15:38

Date Received: 11/03/06 10:00 Date Extracted: 11/16/06 19:13

Date Analyzed: 11/16/06 19:13 Can Dilution Factor:

Not Detected Flag:

U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag	
75014	Vinyl chloride	23.8	125.0	23.8	62.7	329.9 34	9.9.62.7	ULL	1 1
75354	1,1-Dichloroethene	15.0	125.0	148.3	61.4	511.5	606.9		
156605	trans-1,2-Dichloroethene	67.5	537.5	7,758.5	276.3	2,200.4	31,761.2		
156592	cis-1,2-Dichloroethene	106.3	650.0	20,202.0	434.8	2,659.8	82,667.8	ER	P
79016	Trichloroethene	10.0	650.0	170,496.2	55.3	3,595.9	943,201.2	E V	11
127184	Tetrachloroethene	100.0	637.5	100.0	701.0	4,469.0 44	69.001.0	Uil	1
			O-11 A		A		00	Flor	4

		Spike Amt.	Amount		QC	Flag
	Surrogate Recovery	ppbV	ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8	0.200	0.169	85	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

## VIRONMENTAL Analytical Service, Inc.

EPA Method TO-15 Full Scan GC/MS

Analytical Method:

SDG:

206536

TO-15

**Laboratory Number:** 

04

File:

0653604A.D

Date Sampled: 10/30/06 15:38

Description: MV661

Date Received: 11/03/06 10:00

Can/Tube#: 626

Date Extracted: 12/01/06 15:57

Sam\_Type: SA QC\_Batch: 120106-MS3

Date Analyzed: 12/01/06 15:57 **Can Dilution Factor:** 

1.25

Air Volume:

0.03 ml

Not Detected Flag:

CAS#	Compound .	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75014	Vinyl chloride	3,530	21,250	3,530	9,316	56,086	9,316	UR
75354	1,1-Dichloroethene	2,469	21,667	2,469	10,103	88,661	10,103	U
156605	trans-1,2-Dichloroethene	2,170	18,333	11,261	8,885	75,052	46,100	J
156592	cis-1,2-Dichloroethene	1,139	21,458	26,033	4,662	87,809	106,529	7
79016	Trichloroethene	912	21,458	291,096	5,044	118,710	1,610,371	J
127184	Tetrachloroethene	1,602	21,458	1,602	11,231	150,426	11,231	UŘ
			Spike Amt		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8		10.000		10.058	101	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

**Environmental Analytical Service** Page 1 of 1

Report File Name: 20653604.FS3 Printed on 12/3/2006

Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS

**Analytical Method:** 

**TO-15 SIM** 

SDG:

Amount

ug/m3

35,402

428 81

645 80

206536

Laboratory Number:

07

File:

0653607A.D

Compound

Vinyl chloride

1,1-Dichloroethene

trans-1,2-Dichloroethene

Description: MV662

Can/Tube#: 695

Sam\_Type: SA

QC Batch: 111606-MS3 Air Volume:

CAS#

75014

75354

156605

0.1 ml

Date Sampled: 10/31/06 10:11

Date Received: 11/03/06 10:00 Date Extracted: 11/16/06 20:39

Date Analyzed: 11/16/06 20:39 Can Dilution Factor:

MDL

ug/m3

81

80

358

Not Detected Flag:

U

RL

ug/m3

428

663

2,852

2037265	Toluene-d8		0.200		0.179	90	70-130	
	Surrogate Recovery		Spike Am ppbV	it.	Amount ppbV	% Rec.	QC Limits	Flag * = Out
127184	Tetrachloroethene	130	826	709	909	5,792	4,973	JJ
79016	Trichloroethene	13	842	540,094	72	4,660	2,987,849	E 🗸
156592	cis-1,2-Dichloroethene	138	842	31,747	563	3,447	129,910	ER

RL

ppbv

162

162

697

Amount

ppbv

31

19

8,648

Notes: 1) Reported results are to be interpreted to two significant figures.

2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.

MDL

ppbv

31

19

87

- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Report File Name: 20653607.MS3 Printed on 11/29/2006

**Environmental Analytical Service** Page 1 of 1

(28)



EPA Method TO-15 Full Scan GC/MS

SDG:

206536

Analytical Method:

TO-15

**Laboratory Number:** 

07

File:

0653607A.D

Date Sampled: 10/31/06 10:11

Description: MV662

Date Received: 11/03/06 10:00

Can/Tube#: 695

Date Extracted: 11/30/06 13:40

Date Analyzed: 11/30/06 13:40

Sam\_Type: SA QC\_Batch: 113006-MS1

Can Dilution Factor:

1.62

Air Volume:

0.05 ml

Not Detected Flag:

U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75014	Vinyl chloride	2,745	16,524	2,745	7,244	43,613	7,244	UB
75354	1,1-Dichloroethene	1,920	16,848	1,920	7,856	68,943	7,856	U
156605	trans-1,2-Dichloroethene	1,688	14,256	6,377	6,909	58,361	26,106	J
156592	cis-1,2-Dichloroethene	886	16,686	22,587	3,625	68,280	92,426	
79016	Trichloroethene	709	16,686	427,687	3,922	92,309	2,366,008	
127184	Tetrachloroethene	1,246	16,686	1,246	8,733	116,971	8,733	UR
			Spike Amt		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8		10.000		10.474	105	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Environmental Analytical Service

Page 1 of 1

Report File Name: 20653607.FS1 Printed on 12/3/2006

## NVIRONMENTAL Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS

Analytical Method:

**TO-15 SIM** 

SDG:

206536

**Laboratory Number:** 

11

File:

0653611E.D

Description: MV663 Can/Tube#: 817

Sam\_Type: SA QC\_Batch: 120106-MS1 Air Volume:

0.05 ml

Date Sampled: 10/31/06 15:32

Date Received: 11/03/06 10:00 Date Extracted: 12/01/06 21:35 Date Analyzed: 12/01/06 21:35

**Can Dilution Factor:** 

43.20

Not Detected Flag:

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flág
75014	Vinyl chloride	1,642	44,928	1,642	4,333	118,581	4,333	UUT
75354	1,1-Dichloroethene	1,037	44,928	11,418	4,243	183,848	46,722	1 1
156605	trans-1,2-Dichloroethene	4,666	37,152	4,666	19,100	152,091	19,100	U UAT
156592	cis-1,2-Dichloroethene	7,344	44,928	7,344	30,052	183,848	30,052	U
79016	Trichloroethene	691	44,928	55,177	3,824	248,546	305,246	BJ
127184	Tetrachloroethene	6,912	44,064	37,670	48,454	308,895	264,070	J 🎶
			Spike Amt		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8		0.200		0.279	140	70-130	•

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Environmental Analytical Service Page 1 of 1

Report File Name: 20653611.MSM Printed on 12/4/2006

# Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS

Analytical Method:

SDG:

206536

**TO-15 SIM** 

**Laboratory Number:** 

05

File:

0653605A.D

Description: MV664 Can/Tube#: 403

Sam\_Type: SA

QC\_Batch: 120106-MS1 Air Volume:

0.05 ml

Date Sampled: 10/31/06 8:00

Date Received: 11/03/06 10:00 Date Extracted: 12/01/06 16:54 Date Analyzed: 12/01/06 16:54

Can Dilution Factor:

1.63

Not Detected Flag:

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75014	Vinyl chloride	62	1,695	110,410	163	4,474	291,411	EK
75354	1,1-Dichloroethene	39	1,695	3,100	160	6,937	12,687	J
156605	trans-1,2-Dichloroethene	176	1,402	165,310	721	5,739	676,738	ER
156592	cis-1,2-Dichloroethene	277	1,695	333,500	1,134	6,937	1,364,704	E
79016	Trichloroethene	26	1,695	1,054,101	144	9,378	5,831,388	E V
127184	Tetrachloroethene	261	1,663	7,334	1,828	11,655	51,414	J
			Spike Am	t.	Amount		QC	Flag
000000000000000000000000000000000000000	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8		0.200		0.219	110	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Devel

Report File Name: 20653605.MS1 Printed on 12/4/2006

## ENVIRONMENTAL Analytical Service, Inc.

EPA Method TO-15 Full Scan GC/MS

0653605A.D

0.03 ml

Analytical Method:

Description: MV664

QC\_Batch: 120106-MS3

Can/Tube#: 403

Sam\_Type: SA

Air Volume:

File:

SDG:

206536

05

Date Sampled: 10/31/06 08:00

Date Received: 11/03/06 10:00

Date Extracted: 12/01/06 16:47

Date Analyzed: 12/01/06 16:47

Can Dilution Factor:

8.15

Not Detected Flag:

U

**Laboratory Number:** 

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75014	Vinyl chloride	23,013	138,550	79,296	60,740	365,683	209,290	JJ
75354	1,1-Dichloroethene	16,098	141,267	16,098	65,874	578,072	65,874	UK
156605	trans-1,2-Dichloroethene	14,152	119,533	170,548	57,933	489,340	698,182	7
156592	cis-1,2-Dichloroethene	7,428	139,908	541,856	30,396	572,513	2,217,307	
79016	Trichloroethene	5,945	139,908	2,624,194	32,887	773,986	14,517,292	V
127184	Tetrachloroethene	10,446	139,908	10,446	73,225	980,776	73,225	UŘ
			Spike Amt		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8		10.000		10.129	101	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

**Environmental Analytical Service** Page 1 of 1

Report File Name: 20653605.FS3 Printed on 12/3/2006



EPA Method TO-15 SIM GC/MS

SDG:

206536

**Analytical Method:** 

**TO-15 SIM** 

**Laboratory Number:** 

12

File:

0653612A.D

Date Sampled: 11/01/06 7:56

Description: MV665 Can/Tube#: 169

Date Received: 11/03/06 10:00

Date Extracted: 11/27/06 17:46

Sam Type: SA

Date Analyzed: 11/27/06 17:46 Can Dilution Factor:

1.74

QC\_Batch: 112706-MS1 Air Volume:

0.5 ml

Not Detected Flag:

U

MDL RL Amount MDL RL Amount CAS# Compound ppbv ppbv ppbv ug/m3 ug/m3 ug/m3 75014 Vinyl chloride 6.61 180.96 6.61 17.45 477.62 477 10/17.45 75354 17.28 17.09 740.50 740.5070.69 1,1-Dichloroethene 4.18 180.96 156605 trans-1,2-Dichloroethene 18.79 149.64 160.35 76.93 612.59 656.43 156592 cis-1,2-Dichloroethene 29.58 180.96 699.74 121.04 740.50 2,863.38 Trichloroethene. 79016 2.78 180.96 3,348,46 15.40 1.001.09 18.523.99 127184 Tetrachloroethene 27.84 177.48 27.84 195.16 1,244.16 1944/1195.16

					1	
		Spike Amt.	Amount		QC	Flag
	Surrogate Recovery	ppbV	ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8	0.200	0.171	86	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Environmental Analytical Service Page 1 of 1

Report File Name: 20653612.MS1

Printed on 12/4/2006

## NVIRONMENTAL Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS

**Analytical Method:** 

**TO-15 SIM** 

SDG:

206536

Laboratory Number:

06

File:

0653606A.D

Description: MV666

Can/Tube#: 668 Sam Type: SA

QC Batch: 111606-MS3 Air Volume:

0.1 ml

Date Sampled: 10/31/06 8:35

Date Received: 11/03/06 10:00

Date Extracted: 11/16/06 19:56

Date Analyzed: 11/16/06 19:56

1.47

Can Dilution Factor:

Not Detected Flag:

								27
CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75014	Vinyl chloride	28	147	1,615	74	388	4,262	
75354	1,1-Dichloroethene	18	147	883	72	602	3,613	
156605	trans-1,2-Dichloroethene	79	632	65,045	325	2,588	266,278	EK
156592	cis-1,2-Dichloroethene	125	764	85,325	511	3,128	349,156	E
79016	Trichloroethene	12	764	399,734	65	4,229	2,211,366	E V
127184	Tetrachloroethene	118	750	154	824	5,255	1,083	1 1
			Spike Amt.		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8		0.200		0.189	94	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Environmental Analytical Service

Page 1 of 1

Report File Name: 20653606.MS3 Printed on 12/4/2006

## **NVIRONMENTAL** Analytical Service, Inc.

EPA Method TO-15 Full Scan GC/MS

Toluene-d8

Analytical Method:

2037265

TO-15

SDG:

70-130

206536

Laboratory Number:

06

File: 0653606A.D Description: MV666 Can/Tube#: 668 Sam\_Type: SA

QC\_Batch: 112706-MS3 Air Volume: 0.03 ml

Date Sampled: 10/31/06 08:35 Date Received: 11/03/06 10:00

Date Extracted: 11/27/06 18:52

95

Date Analyzed: 11/27/06 18:52 Can Dilution Factor: 1.47

Not Detected Flag:

9.487

U

								97
		MDL	RL	Amount	MDL	RL	Amount	Flag
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	
75014	Vinyl chloride	4,151	24,990	4,151	10,956	65,958	10,956	UK
75354	1,1-Dichloroethene	2,904	25,480	2,904	11,882	104,266	11,882	UV
156605	trans-1,2-Dichloroethene	2,552	21,560	95,166	10,449	88,261	389,587	J
156592	cis-1,2-Dichloroethene	1,340	25,235	99,041	5,482	103,263	405,281	1
79016	Trichloroethene	1,072	25,235	438,855	5,932	139,602	2,427,787	1
127184	Tetrachloroethene	1,884	25,235	1,884	13,208	176,901	13,208	UR
			Spike Amt		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

10.000

**Environmental Analytical Service** Page 1 of 1

Report File Name: 20653606.FS3 Printed on 12/1/2006

## VIRONMENTAL Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS

SDG:

206536

**Analytical Method:** 

**TO-15 SIM** 

Laboratory Number:

09

File:

0653609A.D

Date Sampled: 10/31/06 13:19 Date Received: 11/03/06 10:00

Description: MV667 Can/Tube#: 656

Date Extracted: 11/17/06 17:48

Sam Type: SA

Date Analyzed: 11/17/06 17:48 Can Dilution Factor:

1.48

QC\_Batch: 111706-MS3 Air Volume:

0.1 ml

U

Not Detected Flag:

MDL RL MDL 1 RL Amount Amount CAS# Compound ppbv ppbv ppbv ug/m3 ug/m3 ug/m3 75014 Vinvl chloride 28.1 148.0 28.1 74.2 390.6 390.4 74.2 75354 1,1-Dichloroethene 17.8 148.0 17.8 72.7 605.6 405.6 72.7 U 156605 trans-1,2-Dichloroethene 79.9 636.4 79.9 327.2 2,605.32605.3327.2 U 562.2 2,300.5 156592 cis-1,2-Dichloroethene 125.8 769.6 514.8 3,149.3 79016 Trichloroethene 769.6 28.589.5 65.5 4,257.5 158,159.6 11.8 127184 Tetrachloroethene 118.4 754.8 181.9 830.0 5,291.3 1,275.3

		Spike Amt.	Amount		QC	Flag
	Surrogate Recovery	ppbV	ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8	0.200	0.174	87	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Environmental Analytical Service Page 1 of 1

Report File Name: 20653609.MS3 Printed on 12/4/2006

## ANALYTICAL REPORT

Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS

SDG:

70-130

206536

**Analytical Method:** 

**TO-15 SIM** 

**Laboratory Number:** 

10

File:

0653610A.D

Toluene-d8

Date Sampled: 10/31/06 15:09

Description: MV668 Can/Tube#: 786

Date Received: 11/03/06 10:00 Date Extracted: 11/29/06 16:32

Sam\_Type: SA

Date Analyzed: 11/29/06 16:32 Can Dilution Factor:

0.178

QC\_Batch: 112906-MS1 Air Volume:

2037265

0.5 ml

Not Detected Flag:

U

89

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag	
75014	Vinyl chloride	5.81	159.12	5.81	15.35	419.97 419.	9715:35	U	W.
75354	1,1-Dichloroethene	3.67	159.12	18.05	15.03	651.13 157	.1373.85	J	V
156605	trans-1,2-Dichloroethene	16.52	131.58	34.92	67.65	538.66	142.97	J	J
156592	cis-1,2-Dichloroethene	26.01	159.12	90.25	106.43	651.13	369.32	J	V
79016	Trichloroethene	2.45	159.12	1,515.14	13.54	880.27	8,381.89		1
127184	Tetrachloroethene	24.48	156.06	24.48	171.61	1,094.00 1094	4.0171.61	U	u
	Surrogate Recovery		Spike Amt.		Amount ppbV	% Rec.	QC Limits	Flag	nt .

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

0.200

Environmental Analytical Service Page 1 of 1

Report File Name: 20653610.MS1 Printed on 12/3/2006

(33)

## ANALYTICAL REPORT

Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS

Analytical Method:

**TO-15 SIM** 

SDG:

206536

Laboratory Number:

80

File:

0653608A.D

Description: MV669

Can/Tube#: 160 Sam\_Type: SA

QC\_Batch: 111606-MS3

Air Volume:

0.1 ml

Date Sampled: 10/31/06 10:11

Date Received: 11/03/06 10:00 Date Extracted: 11/16/06 21:22

Date Analyzed: 11/16/06 21:22 Can Dilution Factor:

Not Detected Flag:

U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag	
75014	Vinyl chloride	31	162	31	81	428	428.81	U	U
75354	1,1-Dichloroethene	19	162	19	80	663	463,80	U	V
156605	trans-1,2-Dichloroethene	87	697	7,812	358	2,852	31,981		
156592	cis-1,2-Dichloroethene	138	842	31,172	563	3,447	127,558	E	R
79016	Trichloroethene	13	842	510,313	72	4,660	2,823,102	E	V
127184	Tetrachloroethene	130	826	434	909	5,792	3,039		I
			Spike Amt		Amount		QC	Flag	1
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = O	ut
2037265	Toluene-d8		0.200		0.179	90	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Environmental Analytical Service Page 1 of 1

Report File Name: 20653608.MS3 Printed on 11/29/2006

# ANALYTICAL REPORT



EPA Method TO-15 Full Scan GC/MS

SDG:

206536

**Analytical Method:** 

TO-15

**Laboratory Number:** 

80

File:

0653608A.D

Date Sampled: 10/31/06 10:11

Description: MV669

Date Received: 11/03/06 10:00

Can/Tube#: 160

Date Extracted: 11/30/06 12:56

Sam\_Type: SA

Date Analyzed: 11/30/06 12:56

QC\_Batch: 113006-MS1

Air Volume:

0.05 ml

Can Dilution Factor: Not Detected Flag: 1.62

U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75014	Vinyl chloride	2,745	16,524	2,745	7,244	43,613	7,244	UR
75354	1,1-Dichloroethene	1,920	16,848	1,920	7,856	68,943	7,856	U
156605	trans-1,2-Dichloroethene	1,688	14,256	6,597	6,909	58,361	27,007	J
156592	cis-1,2-Dichloroethene	886	16,686	25,540	3,625	68,280	104,513	
79016	Trichloroethene	709	16,686	438,502	3,922	92,309	2,425,833	
127184	Tetrachloroethene	1,246	16,686	1,246	8,733	116,971	8,733	UR
***************************************			Spike Amt.		Amount		QC	Flag
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = Out
2037265	Toluene-d8		10.000		9.916	99	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Environmental Analytical Service Page 1 of 1

Report File Name: 20653608.FS1 Printed on 12/3/2006





EPA Method TO-15 SIM GC/MS

Analytical Method:

**TO-15 SIM** 

SDG:

206536

**Laboratory Number:** 

13

File:

0653613A.D

Description: MV670

Can/Tube#: 167

Sam\_Type: SA QC Batch: 112906-MS1

Air Volume:

0.5 ml

Date Sampled: 11/01/06 7:59

Date Received: 11/03/06 10:00 Date Extracted: 11/29/06 18:53

Date Analyzed: 11/29/06 18:53 Can Dilution Factor:

1.40

Not Detected Flag:

		MDL	RL	Amount	MDL	RL	Amount	Flag	-
CAS#	Compound	ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3		
75014	Vinyl chloride	5.32	145.60	5.32	14.04	384.29 €	84.2914.04	U	U
75354	1,1-Dichloroethene	3.36	145.60	17.20	13.75	595.80 4	95,5070.39	J	
156605	trans-1,2-Dichloroethene	15.12	120.40	15.12	61.90	492.89	92.8961.90	U	1
156592	cis-1,2-Dichloroethene	23.80	145.60	23.80	97.39	595.80 %	95:4097:39	U	V
79016	Trichloroethene	2.24	145.60	285.70	12.39	805.47	1,580.49		
127184	Tetrachloroethene	22.40	142.80	22.40	157.03	1,001.05	001.01157.03	U	U
			Spike Amt.		-Amount		QC	Flag	ī
	Surrogate Recovery		ppbV		ppbV	% Rec.	Limits	* = O	ut
2037265	Toluene-d8		0.200		0.171	86	70-130		

Notes: 1) Reported results are to be interpreted to two significant figures.

- 2) ug/m3 = ppbV\*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
- 3) MDL and RL are adjusted for sample volume and can dilution.
- 4) U and ND are Flags used for Not Detected
- 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Environmental Analytical Service

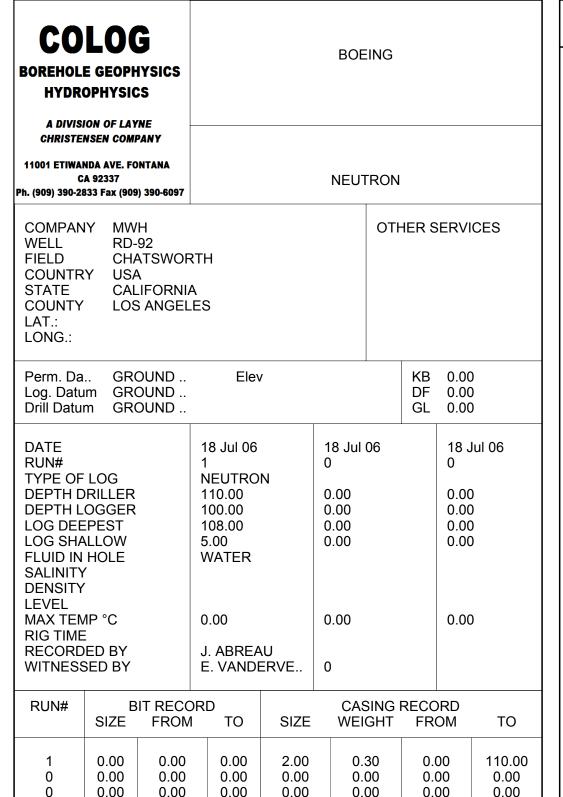
Report File Name: 20653613.MS1

Printed on 12/4/2006

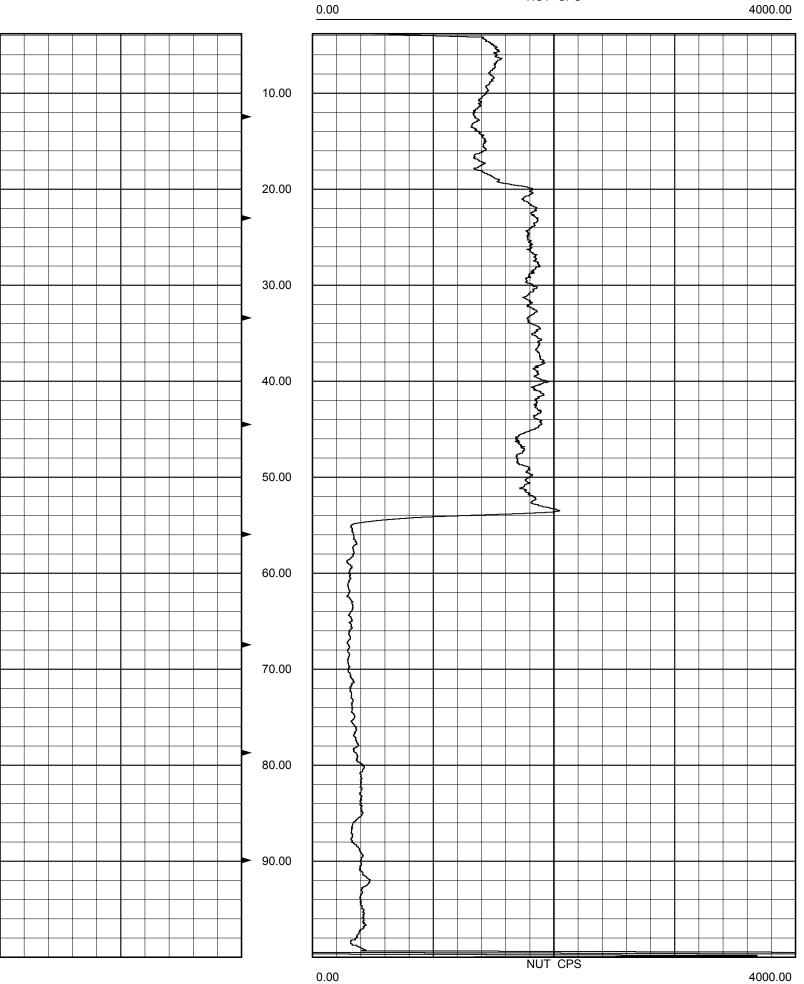
Appendix E

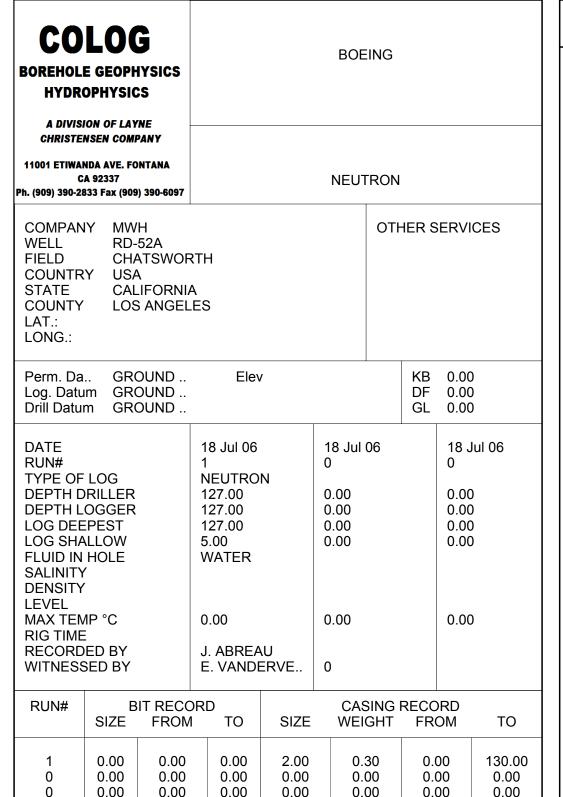
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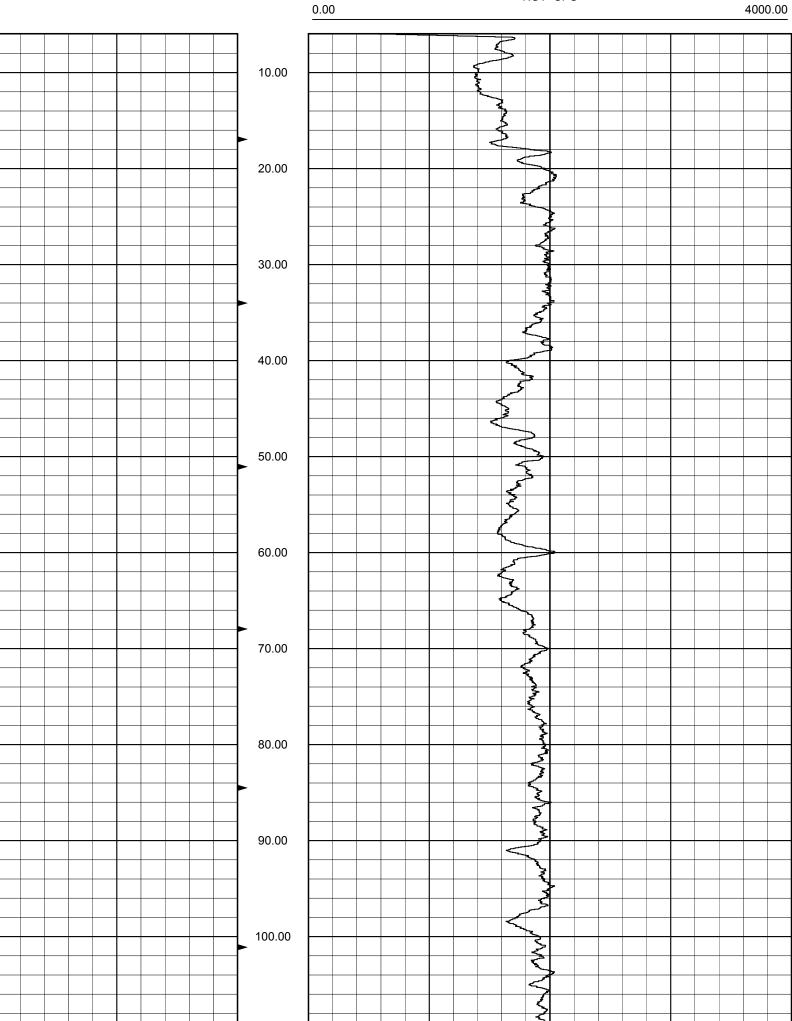
**Neutron Logs** 

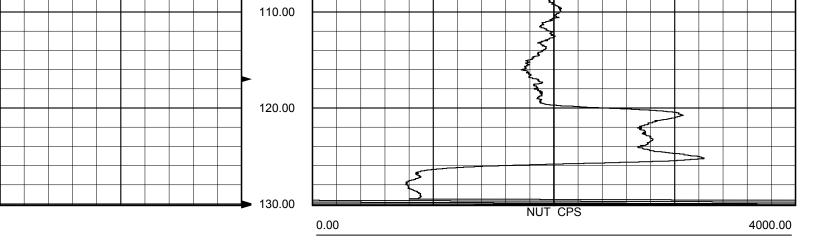


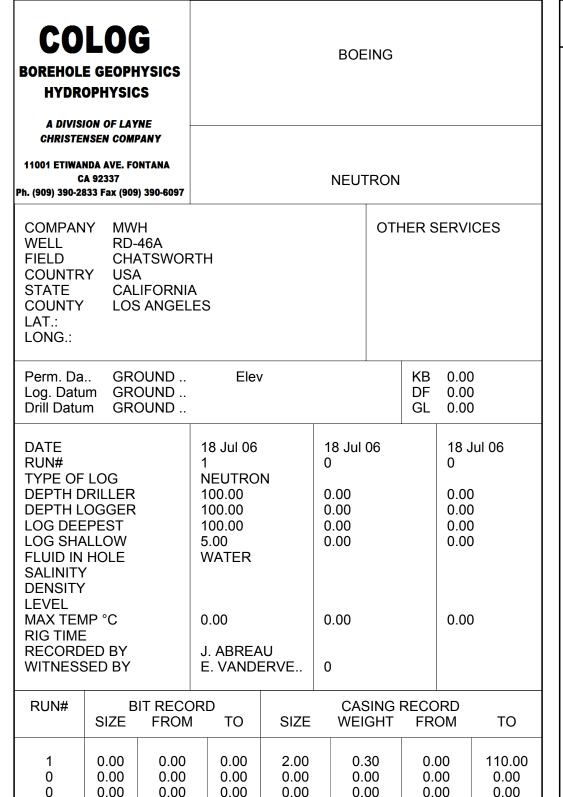
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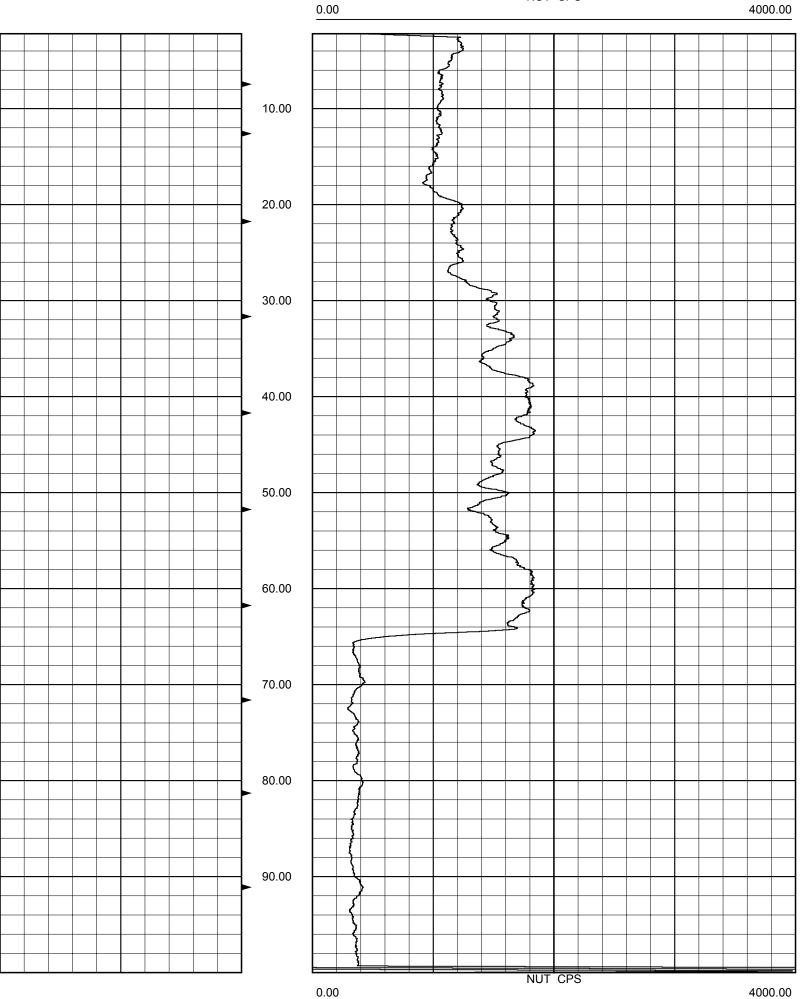




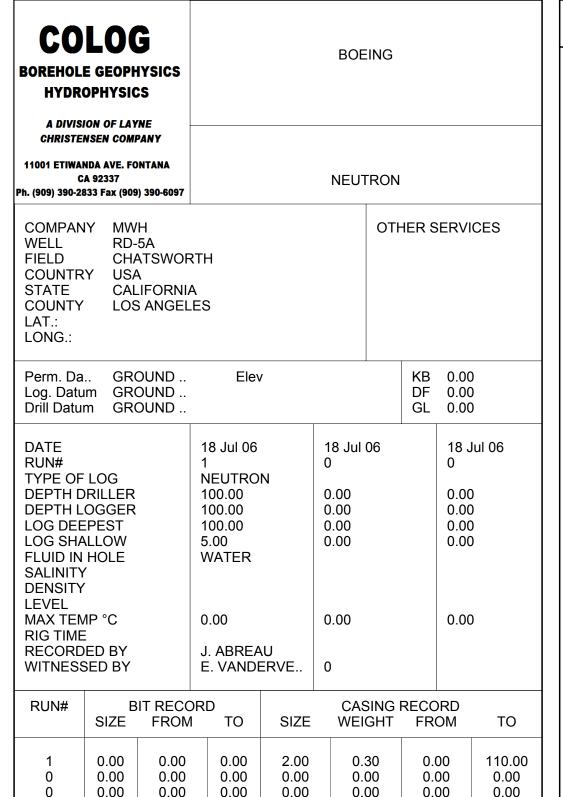




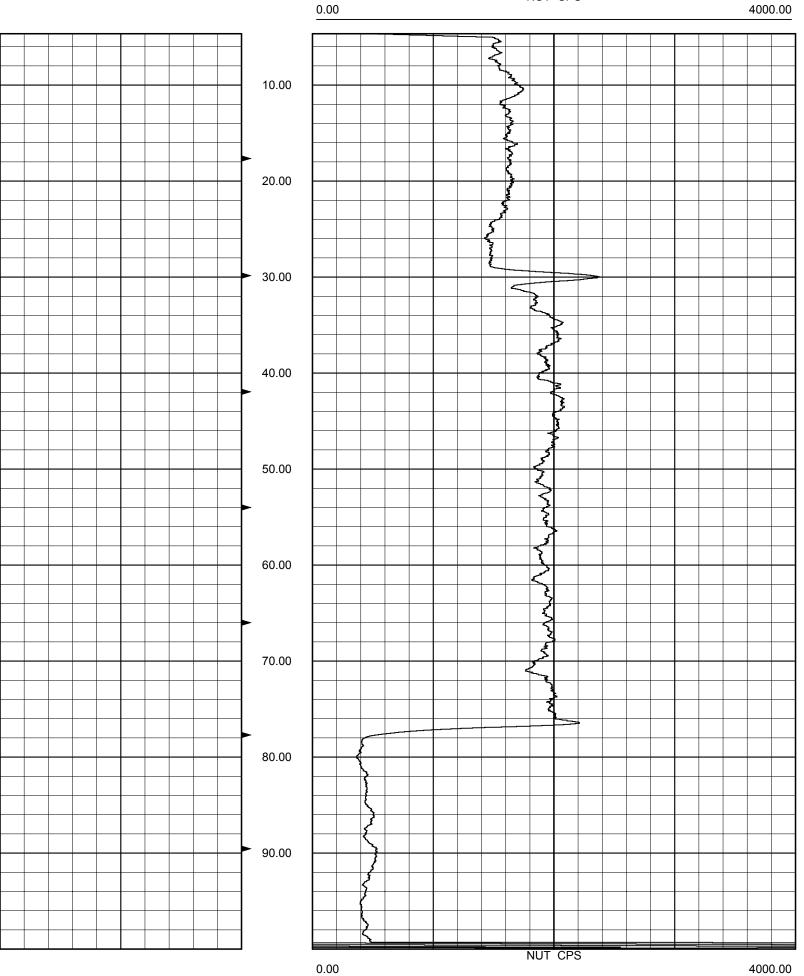
**NUT CPS** 0.00



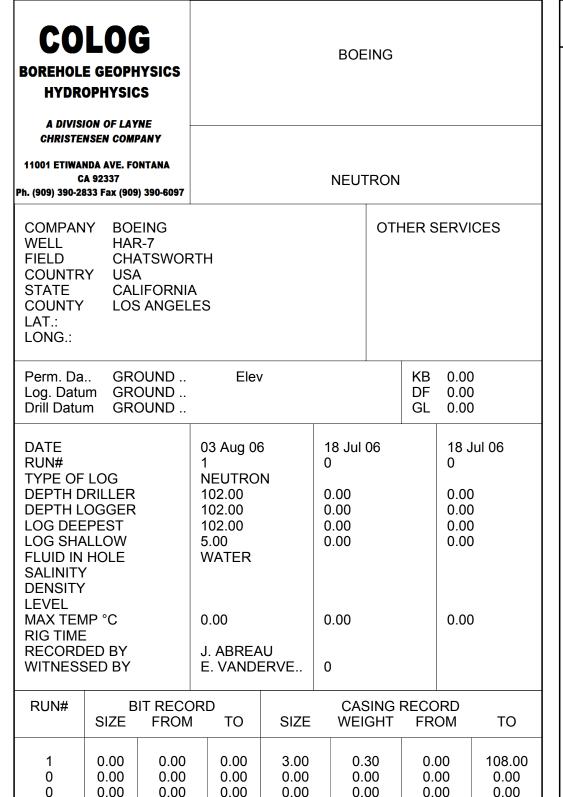
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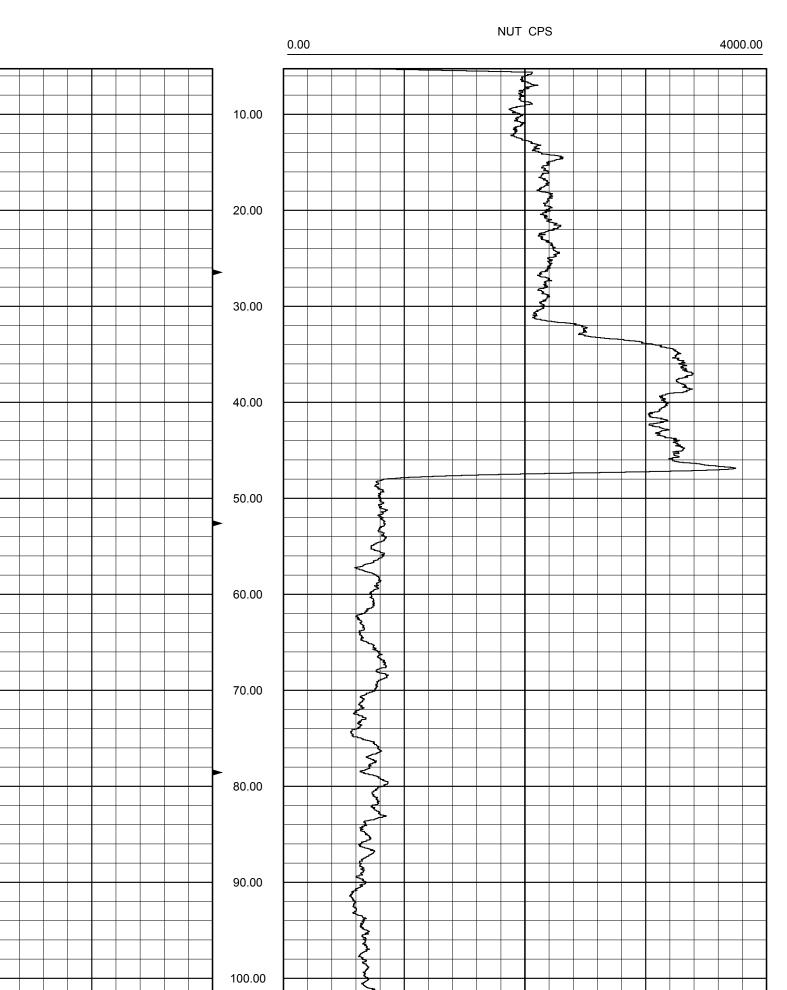


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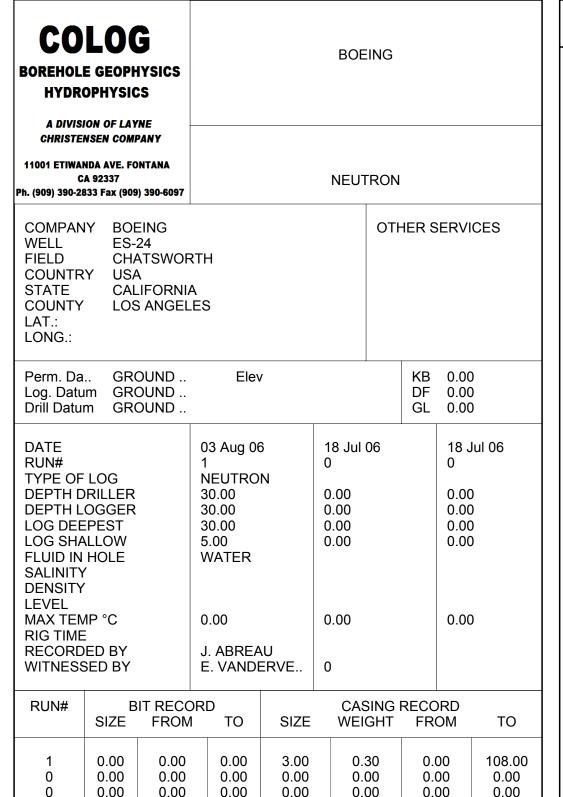


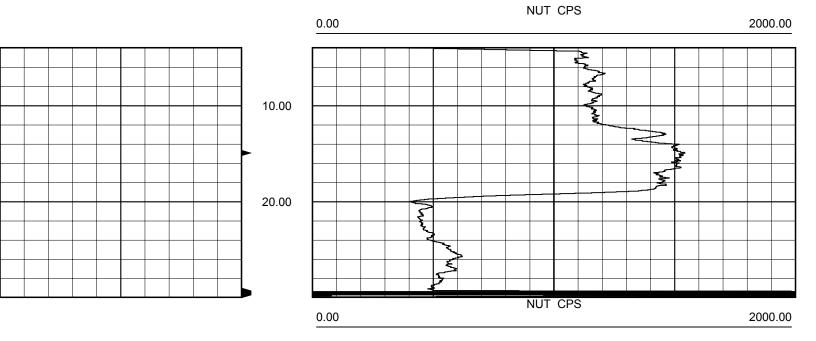
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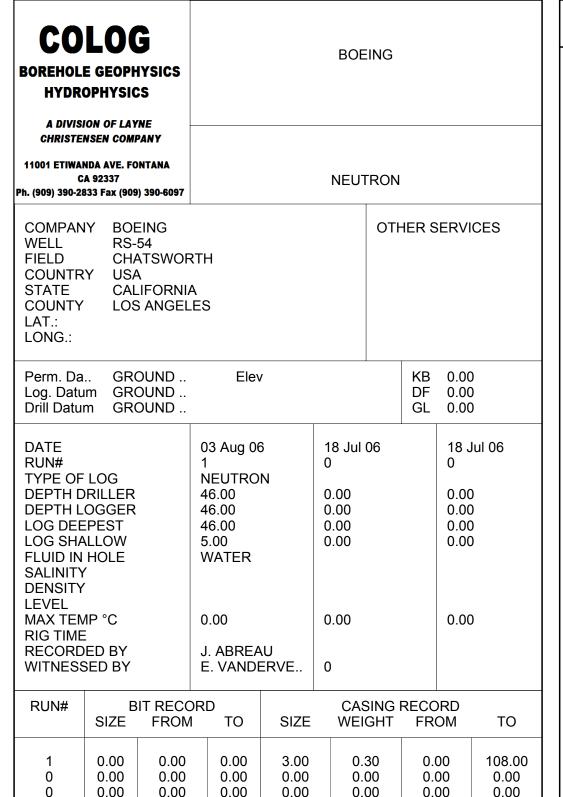


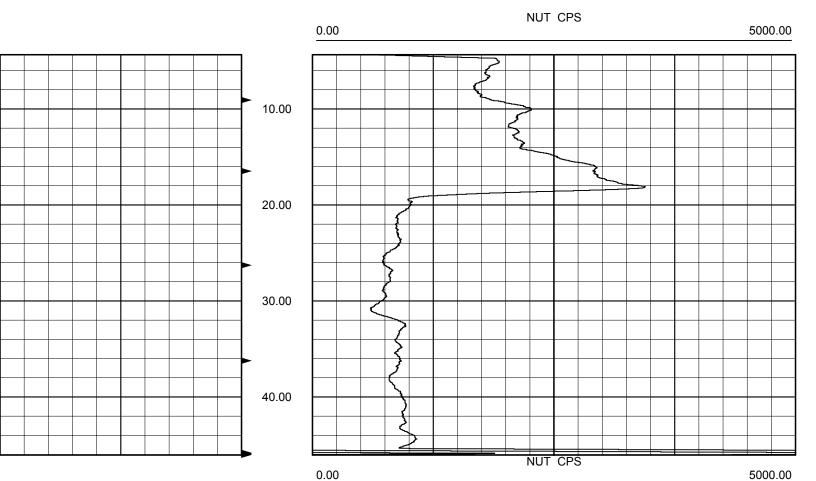
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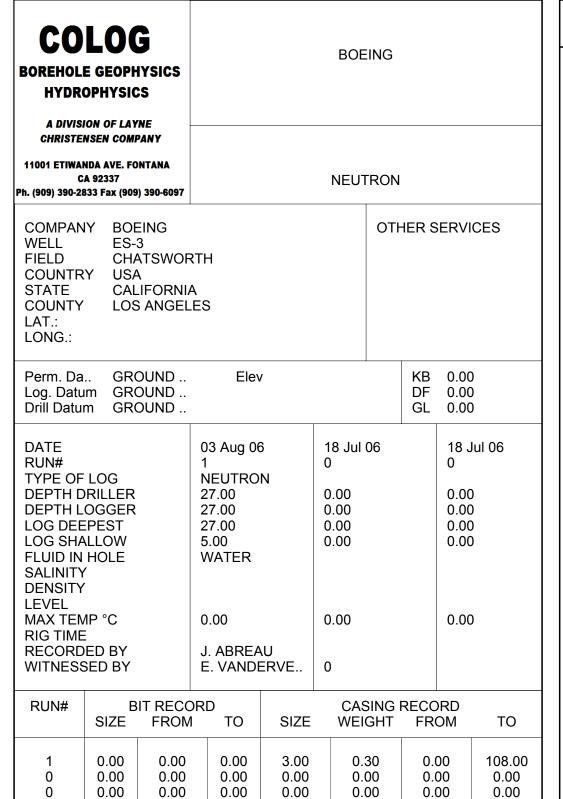


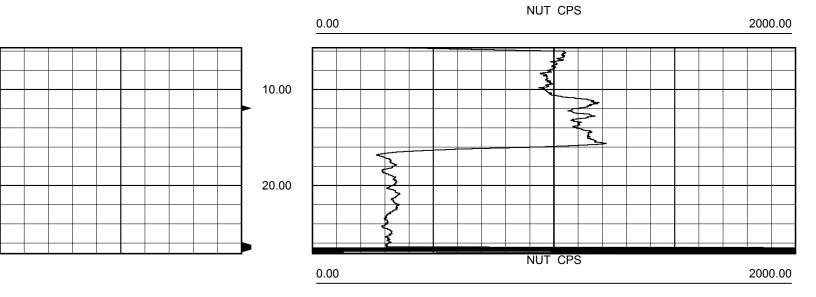
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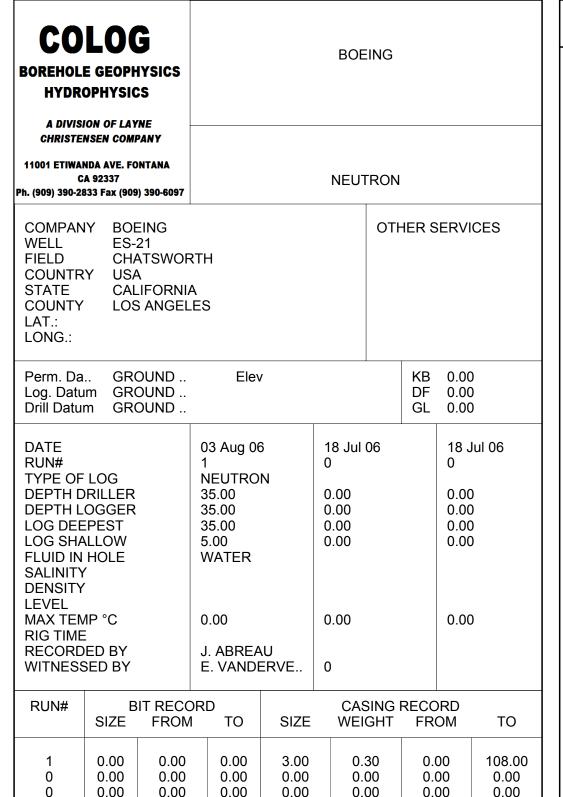


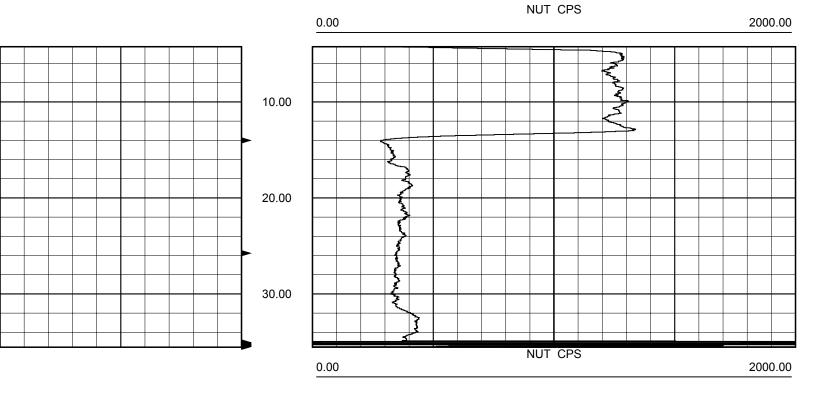
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# Appendix F

(Electronic)

Meteorologic Data

